Continued Statewide Delivery of the Texas Watershed Steward Program

Final Report

TSSWCB Project 11-05

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EXECUTIVE SUMMARY

Texas Watershed Stewards (TWS) is a science-based training program designed to educate stakeholders about watersheds, types and sources of water pollution, water law, state and federal water agencies and organizations, best management practices that minimize or prevent water impairment, and community-driven watershed planning. The program was developed through a collaborative effort between the Texas A&M AgriLife Extension Service and the Texas State Soil and Water Conservation Board, in cooperation with other state and federal water and natural resource management and planning agencies, including the Texas Commission on Environmental Quality, local Soil and Water Conservation Districts, Texas Water Development Board, state River Authorities, Texas Forest Service, Texas Department of Agriculture, United States Department of Agriculture, Natural Resources Conservation Service, and others. TWS is delivered as an intensive, one day, seven hour or four hour training, that utilizes a variety of teaching aids (PowerPoint slides, videos, hands-on stations) and group participation to engage participants in the learning process. Most importantly, the program empowers citizens to become actively involved in local watershed planning efforts to improve and protect their water resources.

To date, a total of 71 workshops have been delivered in watersheds across the state of Texas. Through these events, 3,178 individuals have received a combined total of approximately 20,560 hours of training in topics specifically focused on watershed management and protection. In addition, over 4,583 hours of continuing education units have been provided by the program for a variety of professional certifications. To enhance flexibility and program access to all interested individuals, an interactive on-line version of the training was also developed and launched in February 2011 and redesigned in August 2015. The original version of the online course was completed by more than 123 individuals. In addition, compact discs of the complete program were produced and made available upon request to various groups and individuals.

Intensive publicity efforts employing key media tools and outlets were utilized to market each event. This included the use of news releases distributed state-wide (targeting absentee landowners and other watershed resource users) and to local outlets, radio, television, e-mail list-serves, brochures, and direct contacts with key individuals and partners. In addition, direct contact was made with key local watershed groups, homeowner associations, local city and county officials, Master Gardeners, Master Naturalists and other groups and organizations located in target watersheds. Local County AgriLife Extension Agents provided direct support for planning, organization, publicity and delivery of all programs.

Program effectiveness was evaluated using pre- and post-tests at TWS events to determine changes in knowledge and understanding, as well as intentions to adopt appropriate best management practices (BMPs). A 6-month delayed evaluation was employed to assess actions taken and to verify BMP adoption. Overall, knowledge gained by individuals participating in the training was an impressive 34%. Additionally, over 65% of participants reported an intention to

adopt BMPs to help protect their watershed, and 97% believed the TWS program enabled them to be a better steward of their watershed. Results of the delayed, 6-month evaluation showed that 86% of respondents had participated or planned to participate in at least one community cleanup, 67% had participated or planned to participate in local planning/zoning decisions, and 79% indicated that they had or would communicate with their elected officials regarding water quality issues.

Over 85% of respondents indicated they now more closely monitor individual actions that might impact water quality, and 84% have either adopted or maintained management practices that have a positive impact on water quality. Finally, an overwhelming 95% of respondents were satisfied with the TWS training materials, and 81% have used those resources since the training.

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INTRODUCTION

Every watershed in Texas is affected to some extent by nonpoint source pollution. Resulting water quality impairments lead to negative impacts including unsafe water supplies, degraded fisheries, constrained recreation, reservoir siltation, and habitat loss. These consequences affect communities, businesses, and individual citizens in and around the watershed, and successful management efforts depend on significant local input. As a result, current philosophies in watershed management are based heavily upon securing active stakeholder involvement to restore and protect water resources. This approach to developing watershed based improvement strategies demands a sustained high level of participation by local citizens to achieve success. However, the vast majority of potential stakeholders are not equipped with sufficient understanding of watershed concepts to engage effectively in the decision-making and action processes.

To address this challenge, the Texas A&M AgriLife Extension Service (Extension) collaborated with the Texas State Soil and Water Conservation Board (TSSWCB) and numerous other water resource management entities in Texas to develop a program designed to engage both rural and urban stakeholders and better enable them to become actively and effectively involved in watershed planning efforts (i.e., Watershed Protection Plan and Total Maximum Daily Load development). With funding through a Clean Water Act §319(h) grant from the TSSWCB, the project sought to continue the watershed-based training program, which was initiated with TSSWCB Project 05-05 entitled, *A Community Based Water Quality Curriculum Which Enhances Stakeholder Involvement in Watershed Protection Initiatives: A Pilot Project*. The program, now known as the Texas Watershed Steward (TWS) program, has been continued by the TSSWCB under Projects 07-09, entitled *Statewide Implementation of the Texas Watershed Steward Program;* 15-55, entitled *Additional Delivery of the Texas Watershed Steward Program;* and 11-05, entitled *Continued Statewide Delivery of the Texas Watershed Steward Program*, the latter being the subject of this final report. The success of the TWS program is attributable to the program's design to develop and deliver science-based, community-responsive watershed education tailored to water quality issues in target watersheds. The curriculum has been employed to educate and train local stakeholders and to facilitate active involvement in current or planned water quality improvement projects in their watershed.

RESULTS BY TASK

TASK 1: Project Administration

Subtask 1.1*: Prepare electronic quarterly progress reports (QPRs) for submission to TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 15th of January, April, July, and October. QPRs shall be distributed to all project partners.*

Extension has submitted the required QPRs to the TSSWCB and all project partners for Project 11-05. The QPRs remain on file with the TSSWCB.

Subtask 1.2: *Extension will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly.*

Extension has performed the required accounting functions for TWS program-related funds and submitted applicable Reimbursement Forms to the TSSWCB.

Subtask 1.3: *Extension will host coordination meetings or conference calls, at least quarterly, with project partners to discuss project activities, project schedule, communication needs, deliverables, and other requirements. Extension will develop lists of action items needed following each project coordination meeting and distribute to project personnel.*

Extension hosted the required coordination meetings and/or conference calls between the TSSWCB and other project partners. The TWS program schedule, deliverables, and other program needs and requirements were coordinated and revised as needed.

Subtask 1.4: *Extension, with assistance from SSL, will continue to host and maintain a website (http://tws.tamu.edu/) to serve as a public clearing house for all project related information. All workshop information as the well as the web-based training program will be available at this website.*

The TWS website has been maintained and continually updated using WordPress software. TWS curriculum materials, access to the online course, and program information were made available for viewing and/or download through the website. All future workshop locations were posted on the website, and an online registration system for those workshops was set up.

Subtask 1.5: *Extension will develop a final report summarizing all project activities.*

The submittal of this Final Report for TSSWCB Project 11-05 constitutes a summary of all project activities.

TASK 2: Coordinate and deliver watershed-based TWS trainings in selected watersheds throughout Texas

Subtask 2.1: *Employ an Extension Program Specialist who will serve as the full-time TWS Program Coordinator and will be responsible for the general oversight and coordination of all project activities and for promoting, coordinating, and delivering the TWS watershed-based training events and computer-based tools.*

Throughout the duration of the TWS program, three separate Extension Program Specialists have served in succession to fulfill the duties of TWS Program Coordinator. The first Extension Program Specialist for the TWS program was hired in 2007 and served until 2011. In June 2011, the second TWS Program Coordinator was hired and served until October 2014, at which time the third and current TWS Program Coordinator initiated employment. Each Extension Program Specialist for the TWS program coordinated the development and delivery of the TWS training curriculum and facilitated stakeholder groups, furthering work for the TWS program which began in 2005 with the development of the Texas Watershed Steward Handbook and PowerPoint training modules under TSSWCB Project 05-05. Improvements to the initial presentations utilized for education and training were routinely updated alongside the development and subsequent redesign of an on-line TWS course.

Collaboration with a multi-disciplinary, multi-agency team of project partners was maintained from the initiation of the program in order to better facilitate these efforts. The team consisted of Extension personnel in the Departments of Soil and Crop Sciences, Biological and Agricultural Engineering, Wildlife and Fisheries, Rangeland Ecology and Management, and Agricultural Leadership Education and Communications; the Texas Water Resources Institute (TWRI), the Spatial Sciences Laboratory, the TSSWCB, Texas Commission on Environmental Quality (TCEQ), Texas Department of Agriculture (TDA), Texas Parks and Wildlife (TPWD), Texas Forest Service (TFS), USDA Natural Resources Conservation Service (NRCS), state River Authorities and the United States Environmental Protection Agency (EPA).

Subtask 2.2: *Work in concert with state and local organizations to select watersheds for the watershed-based TWS training events. Extension will coordinate efforts with state agencies and organizations already involved in WPP/TMDL processes or who are planning future WPP/TMDL processes in specific watersheds. Additional watersheds will be selected based on impairment status, environmental sensitivity, and/or other priority issues identified by a partner agency or organization. Extension and TSSWCB will periodically make a collaborative decision to re-prioritize and add to/remove from the list of watersheds.*

Extension and TSSWCB held quarterly teleconferences to prioritize workshop locations. Watersheds were selected for program implementation based on the status of local WPP and/or TMDL projects, as well as steering committee and workgroup development in certain watersheds. Regular communication was conducted via telephone and email between Extension

and TSSWCB regarding prioritization of workshop locations. A working schedule of planned and potential future events was developed and revised as needed (Appendix A).

TWS team collaborators, river authorities, watershed coordinators, and others involved in the development and implementation of water quality projects throughout the state were consulted with on a routine basis to obtain suggestions for potential TWS workshop locations. Local interest in the program was also considered when prioritizing watersheds for implementation and input from all stakeholder groups was welcomed and encouraged throughout the prioritization process. Resulting stakeholder requests were discussed in the quarterly watershed prioritization calls held between Extension and TSSWCB.

Subtask 2.3: *Actively market watershed-based TWS trainings through news releases, internet postings, newsletter announcements, public/conference presentations, flyers, etc., to enhance awareness and utilization. This component of the project will be led by personnel from Texas A&M AgriLife Communications.*

Each TWS training event was aggressively publicized and marketed to maximize participation by local stakeholders. Marketing materials were designed to appeal to a full range of watershed stakeholders, but were written for a non-technical audience.

Press releases and flyers were developed and distributed approximately one to two months prior to an event (Appendix B). Workshop flyers were posted in Extension offices, local businesses, and public areas. To amplify efforts, materials were sent to media outlets with a wide range of audiences in the attempt to reach the largest stakeholder base possible. Outlets for distribution included newspapers, television, radio, newsletters, and others. County Extension Agents (CEAs) working both within the targeted watershed and in surrounding counties were solicited to assist with distribution of marketing materials. Furthermore, numerous newsletter articles were also distributed through the TSSWB, local CEAs, Master Naturalist and Master Gardener programs, and other local associations.

Email lists obtained from CEAs, local watershed coordinators, councils of government, municipalities, chambers of commerce, and local organizations were commonly used to promote and announce events. In some more rural watersheds, invitations were mailed to landowners and agricultural producers containing personalized correspondence and information regarding upcoming TWS trainings in their area (Appendix C).

Presentations and announcements regarding the TWS program were made at various watershed stakeholder meetings, regional conferences, other Extension education events, and to various small groups advocating and raising awareness about the TWS program. Examples include public meetings in the target watershed, the Texas Watershed Planning Short Course, Texas Forest Service roundtable meetings, and other Extension education events. In addition, program updates delivered every six months at the biannual state watershed coordinators roundtable meeting included information regarding future workshop locations.

Extension maintained and routinely updated a website posted at http://tws.tamu.edu for the program. The website includes all resources related to the program, offers online pre-registration for events, and provides access to the online training course.

TWS program materials, which included access to other references and associated web addresses were provided to workshop participants. Attendees were encouraged to use and display the materials publically as a means of advertising the program. This was an effective method of creating a sense of community among participants, and materials have been displayed by many Texas Watershed Stewards at many other unrelated events and on television.

Subtask 2.4: *Deliver at least 10, 8-hour TWS trainings in selected watersheds annually.*

Watershed-based trainings were delivered as one day events and focused on enhancing understanding of watershed systems, watershed impairments, methods for improving watershed function, and community-driven watershed protection and management. After discussions with, and support from, the TSSWCB and other project partners, a four-hour version of the TWS course was also developed and offered in select watersheds to encourage additional participation and watershed stewardship by reaching a constituency that would otherwise be unable to attend the seven-hour course.

The agenda and PowerPoint modules for the event were crafted to integrate pertinent TWS handbook information and the interactive learning stations, leading to a facilitated discussion of local watershed issues (Appendix D). Participants also were given a copy of the TWS handbook and supplemental literature from Extension and TCEQ (Appendix E).

Training events were conducted by a team of Extension Specialists and included a mixture of PowerPoint slides, videos, and hands-on demonstrations. Much of the information included in the training is applicable to all watersheds, and provides a common base of information for participants. However, each event was carefully tailored to the target watershed, by incorporating specific information on land use and cover, water body impairments, and potential pollutant sources. For example, a virtual watershed flyover created using Google Earth software was developed for each event. The watershed flyover provides a visual representation of the watershed concepts, illustrates land use patterns and land/water interrelationships, and enhances visualization of the concept of nonpoint source pollution utilizing the target watershed. Development of a more intimate understanding of, and connection to, the target watershed is a major strength and the ultimate goal of the TWS program.

TSSWCB Project 11-05, which began on September 1, 2011, was originally scheduled to have an end date of August 31, 2014. However, by means of collaborative efforts between stakeholders in target watersheds, other project partners, and the TWS program itself, a one-year no cost extension of the Workplan for Project 11-05 was able to be performed. In total, 38 TWS workshops were delivered under Project 11-05; eight more than initially required by the original Workplan. The workshops attributable to Project 11-05 were attended by 1,499 persons. Since

development of the TWS program, 71 workshops have been delivered, resulting in a total of 3,178 attendees, averaging more than 44 persons per workshop. A photograph taken at a TWS workshop is provided below along with a list of all TWS workshops delivered to date (a notation in the list of delivered workshops denotes the start date of TSSWCB Project 11-05).

Photograph of a Texas Watershed Steward Workshop

Dates, locations, and associated watersheds of conducted TWS Workshops

- December 4, 2007: Kyle, TX (Plum Creek Watershed)
- January 24, 2008: Wellington, TX (Buck Creek Watershed)
- March 25, 2008: Pflugerville, TX (Gilleland Creek Watershed)
- April 2, 2008: Brady, TX (Brady Creek Watershed)
- May 30, 2008: Lake Jackson, TX (Bastrop Bayou Watershed)
- June 10, 2008: Georgetown, TX (Lake Granger Watershed)
- July 23, 2008: Denton, TX (Hickory Creek Watershed)
- August 6, 2008: Luling, TX (Plum Creek Watershed)
- September 25, 2008: Lampasas, TX (Lampasas River Watershed)
- October 30, 2008: Comanche, TX (Leon River Watershed)
- November 20, 2008: Monte Alto, TX (Arroyo Colorado Watershed)
- March 3, 2009: Franklin, TX (Little Brazos River Watershed)

- June 30, 2009: Granbury, TX (Lake Granbury Watershed)
- July 15, 2009: Fort Worth, TX (Eagle Mountain Watershed)
- August 25, 2009: Kaufman, TX (Cedar Creek Watershed)
- October 22, 2009: Wimberley, TX (Cypress Creek Watershed)
- November 10, 2009: Seguin, TX (Geronimo and Alligator Creeks Watershed)
- December 3, 2009: Jefferson, TX (Caddo Lake Watershed)
- January 21, 2010: West Columbia, TX (San Bernard River Watershed)
- March 25, 2010: Boerne, TX (Upper Cibolo Creek Watershed)
- April 29, 2010: Junction, TX (South Llano River Watershed)
- May 12, 2010: Seven Points, TX (Cedar Creek Watershed)
- August 26, 2010: Kerrville, TX (Guadalupe River above Canyon Lake)
- September 9, 2010: Nacogdoches, TX (Attoyac Bayou Watershed)
- September 21, 2010: Utopia, TX (Sabinal River Watershed)
- October 21, 2010: Athens, TX (Middle Trinity River Watershed)
- January 27, 2011: Panna Maria, TX (Lower Cibolo Creek Watershed)
- March 29, 2011: College Station, TX (Carters and Burton Creeks Watershed)
- May 12, 2011: Corpus Christi, TX (Lower Nueces Watershed)
- June 28, 2011: Pecos, TX (Pecos River Watershed)
- June 29, 2011: Iraan, TX (Pecos River Watershed)
- July 14, 2011: Temple, TX (City of Temple Watersheds)
- August 30, 2011: Baytown, TX (Cedar Bayou Watershed)

----------Beginning of TSSWCB Project 11-05----------

- September 28, 2011: Uvalde, TX (Leona River Watershed)
- October 24, 2011: Orange, TX (Adams/Cow Bayous Watershed)
- November 9, 2011: Dallas, TX (City of Dallas Watersheds)
- November 10, 2011: Dallas, TX (City of Dallas Watersheds)
- February 22, 2012:La Marque, TX (Highland Bayou Watershed)
- March 23, 2012: San Angelo, TX (Concho River Watershed)
- April 18, 2012: Victoria, TX (San Antonio Bay Watershed)
- May 9, 2012: El Paso, TX (Paso del Norte Watershed)
- June 12, 2012: Smithville, TX (Colorado River Watershed)
- July 10, 2012: San Antonio, TX (San Antonio River Watersheds)
- July 11, 2012: San Antonio, TX (San Antonio River Watersheds)
- August 30, 2012: Junction, TX (Llano River Watershed)
- October 23, 2012: San Marcos, TX (San Marcos River Watershed)
- January, 24, 2013: Navasota, TX (Navasota River Watershed
- February 12, 2013: Lewisville, TX (Lake Lewisville Watershed)

- March 28, 2013: Lampasas, TX (Lampasas River Watershed)
- April 30, 2013: La Marque, TX (Dickinson Bayou Watershed)
- May 22, 2013: Fredericksburg, TX (Pedernales River Watershed)
- June 25, 2013: Oak Island, TX (Double Bayou Watershed)
- August 21, 2013: Hamilton, TX (Leon River Watershed)
- September 19, 2013: Killeen, TX (Nolan Creek Watershed)
- October 11, 2013: Austin, TX (City of Austin Watersheds)
- November 5, 2013: Sugar Land, TX (City of Houston Watersheds)
- November 6, 2013: Spring, TX (City of Houston Watersheds)
- February 17, 2014: Tyler, TX (Neches River Watershed)
- February 18, 2014: Nacogdoches, TX (Angelina River Watershed)
- March 22, 2014: Bandera, TX (Medina River Watershed)
- April 15, 2014: Ennis, TX (Richland-Chambers Watershed)
- May 22, 2014: Victoria, TX (Lavaca-Navidad Rivers Watershed)
- July 17, 2014: Dripping Springs, TX (Onion Creek/Barton Springs Watersheds)
- December 4, 2014: Corpus Christi, TX (Oso Creek/Oso Bay Watershed)
- January 9, 2015: Bellville, TX (Mill Creek Watershed)
- March 3, 2015: Friendswood, TX (Clear Creek Watershed)
- March 25, 2015: Dublin, TX (Leon River Watershed)
- April 21, 2015: Palacios, TX (Tres Palacios Watershed)
- May 7, 2015: Kosse, TX (Navasota River Watershed)
- June 23, 2015: Granbury, TX (Lake Granbury Watershed)
- July 21, 2015: League City, TX (Dickinson Bayou Watershed)

The TWS program obtained/maintained certification to provide continuing education units (CEUs) for a variety of professional affiliations. Providing CEUs was a valuable added incentive for participation of many professionals and CEU offerings were utilized as a part of the marketing effort. The maximum number of qualified/authorized CEUs provided by the TWS program include:

- 7 AICP (American Institute of Certified Planners) CM hours for planners (5.5 CM credits, 1.5 CM Law)
- 7 CCA (Certified Crop Advisor) CEUs in Soil & Water Management
- 7 TBPE (Texas Board of Professional Engineers) CEPs for professional engineers
- 7 SBEC (State Board for Educator Certification) CPEs in Science
- 3 TDA (Texas Department of Agriculture) CEUs for pesticide license holders
- 3 TFMA (Texas Floodplain Management Association) CECs for Certified Floodplain Managers
- 4 TCEQ (Texas Commission on Environmental Quality) Occupational License continuing education credits offered for each of the following: Landscape Irrigators, On-

site Sewage Facility Installers, Public Water System Operators, and Wastewater System Operators

At the conclusion of TWS trainings, participants received a personalized Certificate of Completion. Certificates include the participant's name, date and location of the event, as well as CEU information. Combined with the event sign-in sheets, certificates also served as proof of attendance for those requesting CEUs.

Subtask 2.5: *Foster the establishment of local watershed action groups spawned by the TWS program. Develop and/or provide more detailed, resource specific education and training resources and action oriented activities that can be delivered and/or undertaken in watersheds where those issues are identified as most significant.*

One key component of the training program is Community-based Watershed Involvement. Participants were provided examples of how to become involved in local activities aimed at protecting and improving water resources. In addition, all existing programs provided through Extension and other agencies and organizations were highlighted at each training event. Members of stakeholder groups, water quality monitoring groups, Keep Texas Beautiful, Master Gardeners, Master Naturalists, and other community groups were encouraged to attend and provide information regarding their activities and programs in the watershed.

In addition, each event included an update from the local watershed coordinator, or other appropriate individual, providing the status of local watershed planning and management activities. These presentations served as an introduction to facilitate discussion geared toward promoting dialogue among participants and bolstering support for existing WPP/TMDL efforts and stakeholder groups, creation of new watershed groups, and initiation of community watershed events and activities.

Following completion of workshops, Extension has received additional requests from workshop participants to conduct presentations related to Texas Watershed Stewards and water quality. Requests received include those from Master Gardener and Master Naturalist groups, Teachers, Concerned Community Members, and other individuals and organizations. Extension will continue to serve as an information source to all workshop participants regarding helpful publications and educational materials, upcoming stewardship activities (i.e., stream cleanups, etc.), upcoming project meetings and workshops, etc.

Subtask 2.6: *Attend and participate in meetings, as appropriate, in order to communicate project goals, activities and accomplishments to affected parties. Such meetings may include, but are not limited to Clean Rivers Program Basin Steering Committees, the Texas Watershed Planning Short Course, Texas Watershed Coordinator Roundtables, and the TSSWCB Regional Watershed Coordination Steering Committee.*

The TWS Program Coordinator and co-presenters of the TWS Program, attended the meetings required by Subtask 2.6 of the Workplan for TSSWCB Project 11-05 in addition to many others, such as the Soil and Water Conservation Society's Annual Conference and TCEQ Central Texas Environmental Summit. At each meeting/event, the TWS Program was highlighted and discussed.

Subtask 2.7: *Work with the NPS management agencies (Louisiana Department of Environmental Quality, Louisiana Department of Agriculture and Forestry, Arkansas Natural Resources Commission, Oklahoma Conservation Commission, and New Mexico Environment Department) and the extension agencies in each of the States in EPA-Region 6 to explore and promote the feasibility of developing a watershed steward program in each state based on the success of the TWS program.*

Colleagues at the University of Arkansas received grant funding to develop and implement a watershed based training program similar to TWS in Arkansas. Their handbook is complete and workshop delivery is underway. Extension continues to be in touch and provide assistance as needed to the University of Arkansas to aide in the development and implementation of their watershed based training program in Arkansas and the associated 'Arkansas Watershed Steward Handbook' (Appendix F). Additionally the Paso del Norte TWS workshop was conducted in concert with the New Mexico Environment Department, New Mexico Department of Agriculture, New Mexico Extension, and Paso del Norte Watershed Council. Personnel from these aforementioned New Mexico NPS management agencies were in attendance and witnessed a firsthand demonstration of the TWS program. The TWS program is also represented and advertised at national conferences with state and federal agency officials, water managers, and other members of the public in attendance.

Subtask 2.8: *Work with the appropriate entities (e.g., Texas Education Agency) to explore the potential for developing a youth-oriented TWS program component.*

Dialogue and counsel was sought between the TWS Program Coordinator and Extension personnel with expertise in youth education to explore the development of a youth-oriented TWS program component. In doing so, youth water quality education materials were obtained from the Clear Water Groundwater District, Texas Parks and Wildlife Department, Texas Water Development Board, Environmental Protection Agency, and other agencies/entities. The aforementioned materials were reviewed for aspects which could aid in conceptualizing the development of a youth-oriented TWS program component.

As a result of these and other networking connections and partnerships developed by Texas Watershed Stewards, the first youth-oriented TWS Workshop was held in Friendswood, TX on March 3, 2015. This pilot program was delivered to Advance Placement Environmental Science high school students of Clear Falls High School, teachers, and officials of the Clear Creek Independent School District (ISD). The curriculum used for the event was comparable to the

material used during a standard TWS workshop, with the exception of additional hands-on/tactile demonstrations and additional interactive questions and answer sessions. For example, a Creekside water sampling demonstration was provided with the assistance of the Houston-Galveston Area Council (Appendix G). The same pre-and post-test used in standard TWS workshops was administered to students of the pilot TWS program. Results of pre-and post-test data indicate that the reported knowledge gained (28%) by high school students was comparable to adult focused TWS programs (34%). However, it is important to note that the sample size of the statistics used to determine youth knowledge gain is naturally much smaller for the single youth TWS workshop than that for 70 adult TWS workshops.

Additionally, the TWS program delivered two, one-hour discussions regarding watersheds and water quality to high school youth (grades 9th through 11th) at the Sustainable Communities Project Leadership Camp 2015 held at Forest Glen Camp in Huntsville, TX on June 13, 2015. Presentation strategies and materials previously used during the March 3, 2015 youth-oriented TWS Workshop held in Friendswood, TX were used for the Forest Glen Camp presentation.

After reviewing pre/post-test data and feedback from these events, including input from educational professionals, the youth-oriented TWS program was regarded as a success given a request by Clear Creek ISD that the program be delivered again the next school year and the knowledge gain reported for youth was similar to that of adults. However, potential obstacles to establishing a sustainable youth-oriented component of the program include the standard duration of the TWS course. Though the TWS curriculum can be modified to be applicable to pre-AP and AP classes for secondary education students, many school districts are unable to devote a full class day to a TWS workshop. Therefore, select TWS programs can continue to be explored. For example, options to be explored include further advertisement to teachers about the online version of the TWS course, and offering TWS in select watersheds as a one-day summer training for students on break.

TASK 3: Distribute and manage computer-based training tools for the TWS program

Subtask 3.1: *Manage and update web-based and CD ROM-based versions of the TWS program. Program information will be reviewed every six months and updates made as needed.*

Using Toolbook Instructor 9.5, the original interactive training version of the TWS program was created and made available online. Since that time, the online course has undergone several iterations to improve aesthetics, course navigability, and conveyance of information. The newest version of the online course was published in August 2015 (Appendix H). The online course materials were made accessible from the program website at http://tws.tamu.edu/online-training-course/.

The on-line based version allows those unable to attend a watershed-based workshop to complete the course curriculum, providing more flexible and widespread access to the program. The on-line course was designed to be an interactive experience, providing videos, user activated

animations, and the ability to navigate course material freely. The course can be accessed anonymously; however, in order to receive a certificate of completion participants must enroll in the course and complete the pre- and post-test evaluations. Enrollment in the course is open to all, and requires users to submit their country, state, and city of residence along with a valid email address.

CD ROMS containing TWS program materials were distributed at the request of project partners that helped coordinate TWS workshops as well as to any and all interested workshop participants. Extension County Agents and interested workshop participants were made aware that CDs containing the TWS material are available. However, technological advances have resulted in these materials commonly being requested as downloadable electronic files. Therefore, in addition to offering CD ROM copies of TWS materials, electronic files are made available at TWS workshops for download to USB drives and through the TWS website.

Subtask 3.2: *Duplicate, package, and distribute the CD ROM-based version of the TWS program. Distributions also will be made at the request of project partners, and in response to marketing efforts accomplished under Subtask 2.3.*

CD-ROMs containing watershed-based TWS training materials were created and distributed upon request after a workshop. CD ROMs included event-specific versions of the PowerPoint presentations, virtual watershed tours, and watershed maps. With growing access and availability to computers and the internet, the need for CD ROM-based versions of the TWS program was not as great as anticipated. The online course quickly became the preferred method by stakeholders for remote access to the TWS training curriculum.

Subtask 3.3: *Actively market computer-based TWS resources through news releases (AgriLife News and local media outlets), internet postings, newsletter announcements, public/conference presentations, flyers, etc., to enhance utilization and public participation.*

Participants at watershed-based TWS trainings were made aware of the online course availability and were encouraged to pass that information along. Press releases were distributed announcing the availability of the TWS online course and were published through a number of media outlets. Additionally, a video press release for the TWS program was created in 2015, highlighting access to the online course (Appendix I).

Extension coordinated with TWRI information technology specialists so that the TWS website would be more visible in internet search results. As a result, internet searches containing combinations of keywords such as “Texas”, “Watershed”, and “Online Course” would readily produce a link to the TWS website. Because of these efforts, more than 123 participants have enrolled in and subsequently completed the online course since it was made available early in 2011.

Subtask 3.4: *Track website usage and CD ROM distribution.*

The Moodle platform used to support the online course has built in mechanisms for tracking usage. Online course administrators are able to view participant information and their activity. Moodle provides reports for pre- and post-test responses and course access data from those enrolled in the course (Appendix J). The online course allows users to view course content without enrolling in the course however, only enrolled users are able to complete the pre/post tests and receive a certificate of completion.

Google Analytics was used to track overall website traffic (Appendix K). Since the TWS website went live in 2008 it has been visited over 20,000 times by 12,000 unique visitors. The vast majority of visits originated from users in the USA: however, the website received traffic from more than 60 different countries on 6 continents. A method for evaluating CD distribution and usage was never merited because utilization of the online course became the preferred method of participation.

TASK 4: Evaluate the effectiveness of the watershed-based trainings and computer-based training tools

Subtask 4.1: *Conduct pre/post-test evaluations (for both watershed-based and computer-based trainings) to measure knowledge gained by participants regarding watershed principles, appropriate BMPs, and other activities to address impairments caused by NPS pollution, to evaluate participant satisfaction with the program and to evaluate participant's intentions to change their behavior as a result of the program.*

Working with faculty in Agricultural Leadership Education & Communications (ALEC) and Organizational Development, Extension made several revisions to the pre- and post-tests and to methods by which the data are analyzed. The original versions of the pre- and post-tests, developed in 2007, were altered to remove select questions and replace them with questions to more accurately gauge knowledge gained. The revised version of the pre/post-test was first used in October 2008 and has been the version used thereafter (Appendix L). Furthermore, analysis of individual questions from October 2008 until now revealed that 7 of the 18 knowledge questions were answered correctly sufficiently often as to be considered common knowledge for almost 80% of participants as described in Subtask 4.3. These 7 questions were therefore excluded from the final analysis, and the remaining eleven questions were used to calculate knowledge gain. Additional questions on the post-test evaluate participant satisfaction along with a participant's intentions to adopt BMPs.

The pre- and post-test evaluation instruments were delivered at TWS workshops. Following the workshops, the pre- and post-tests were mailed to Agricultural Leadership, Education, and Communications Department at Texas A&M University to be assessed. Results from the TWS workshop pre- and post-tests conducted through August 2015 have been analyzed. While the

results are provided in Appendix N, a discussion regarding them is provided in the TSSWCB Project 11-05 Final Report discussion of *Subtask 4.3*, provided below.

Subtask 4.2: *Deliver Phase 2 follow-up evaluation assessment (6 month follow-up for both watershed-based and computer-based trainings) to assess actions taken and practice adoption by participants.*

Six months after each workshop, delayed post-evaluations were distributed to workshop participants and responses were received electronically via Qualtrics software platform (Appendix M). The post-evaluation itself assesses the watershed stewardship actions, such as adoption of one or more BMPs, taken by previous workshop attendees. Following receipt of completed 6-month post-evaluations, the data was compiled and submitted to the Department of Agricultural Leadership, Education, and Communications at Texas A&M University for analysis. While the results are provided in Appendix O, a discussion regarding them is provided in the TSSWCB Project 11-05 Final Report discussion of *Subtask 4.3,* provided below.

Subtask 4.3: *Analyze results obtained from Phase 1 and Phase 2 evaluations using descriptive, correlational, and analysis of variances statistical procedures. Results will be used periodically to evaluate and modify TWS program materials and incorporated into the Final Report.*

Assessment of completed pre- and post-test (Phase 1 evaluations) and six month follow-up evaluations (Phase 2 evaluations) was performed by the Agricultural Leadership, Education, and Communications Department at Texas A&M University. Results from the analysis of Phase 1 and Phase 2 evaluations are discussed below and provided in Appendix N and Appendix O, respectively.

Phase 1

With the assistance of personnel in Organizational Development, Phase 1 pre- and post-test data were collected and analyzed using SPSS software (Appendix N). Individual questions were analyzed for pre/post-test comparison and were cross-tabulated for better interpretation of results. Knowledge gain was derived from 18 pre- and post-test questions pertaining to watersheds, fresh water, pollution, and policy and government. The same 18 questions were used on both evaluations. Knowledge gain for each question was calculated from the difference in percentage points between number of questions answered correctly on the pre-test versus the number answered correctly on the post-test. For example, if a valid pre-correct response of 70% is reported and the reported valid post-correct response is 96.7%, the knowledge gain for such a questions would be 26.7%; i.e., the difference between the valid percent of pre-correct and post-correct responses.

Individual question analysis indicated that almost 80% of all participants answered the same 5 questions correctly on both the pre- and post-tests. These 5 questions were therefore considered to be common knowledge for the majority of participants and were excluded from the final

knowledge gain calculation. The 5 questions excluded are pre/post test questions 1, 4, 5, 6, 11, 12, and 13 (Appendix L).

An overall knowledge gain of 34% was reported for participants. For questions relating to watersheds there was an overall knowledge increase of 28.8% and for questions relating to fresh water there was an increase of approximately 39.7%. Furthermore there was a knowledge increase of over 36.8% for pollution questions and an increase of 36.1% for policy and government questions regarding water quality.

Pre/post-test data indicated a high percentage of participants overall intended to engage in activities aimed at improving water quality. Out of all respondents, 22% left trainings with the intention to participate in community cleanup activities and over 20% wanted to get involved in local planning/zoning decisions. Furthermore, 29.2% intended to communicate water issues with elected officials, 23.1% intended to help develop a plan for their watershed, and 20.5% percent intended to help form or become a member of a local watershed group. Most importantly, over 65% percent of participants reported an intent to adopt BMPs to help protect their watershed and 97% felt that the TWS program provided them with the ability to be a better steward of their watershed.

Phase 2

Phase 2 evaluations were sent out electronically approximately six months after a training event via email using addresses collected through event registrations and sign-in sheets. The survey consisted of 15 multiple choice questions relating to adoption of BMPs and utilization of education materials following a training event. Since there was no corresponding pre-test or any correct/incorrect answers to Phase 2 questions, complex analysis was not required. Responses were compiled into a summarized report for analysis and interpretation (Appendix O).

Six-month follow-up evaluations continued to indicate positive impacts, even several months after the training. Among respondents, 46% had participated in at least one community cleanup in the past six months and another 40% indicated that they had plans to participate in a future cleanup. Approximately 41% of respondents had participated in local planning/zoning decisions, and another 26% planned to get involved in those types of activities in the near future. Furthermore, 56% stated that they had communicated with their elected officials regarding water quality issues and an additional 23% planned to do so.

Another positive result of TWS training, as indicated in the delayed post-evaluation, is the resulting level of involvement of attendees in volunteer water quality monitoring programs. Approximately 29% of respondents had participated in such programs and 27% planned to get involved.

One of the most desired impacts of the program is to encourage participants to engage in their own community and actively share the knowledge they gained at the trainings. Within six

months of receiving TWS training, 40% had given a water quality presentation to a school class or community group and another 21% planned to do so. Surveys also showed that 70% of respondents had encouraged others to participate in the training.

Over 85% of respondents indicated they now more closely monitor individual actions that might impact water quality, and 84% have either adopted or maintained management practices that protect water quality. For example, approximately 33% had adopted soil testing practices and another 37% indicated they plan to conduct soil testing in the future to better manage fertilizer application.

In regards to satisfaction, an overwhelming 95% of respondents were satisfied with the TWS training materials, and 81% have used those resources since the training. Lastly, over 65% of respondents had already shared the materials with their peers at the time of the 6-month post-evaluation, further indicative of the continued interested among the general public in the TWS program.

CONCLUSIONS

In close coordination with the TSSWCB and other state, federal and local partners, the Texas AgriLife Extension Service has conducted 71 Texas Watershed Steward workshops across the state of Texas that have educated 3,178 stakeholders through approximately 20,560 contact hours. Both face-to-face and online training resources have been developed and delivered to citizens providing flexible access to science-based watershed management information.

Although it is often challenging to measure the impact of educational programs, the success of this project has been demonstrated by measured increases in knowledge, understanding and adoption of water quality management practices. In addition, the program has documented greater citizen involvement in local watershed programs and activities as a result of the training. Continued statewide implementation of the TWS program will support and enhance current and future watershed management and protection efforts undertaken by water resource management agencies and organizations in Texas, and most importantly, will continue to engage and empower local citizens to be the driving force for protection of their watershed.

Appendix

Appendix A

Example Re-Prioritized List of Future TWS Workshop Locations (this schedule originated from the 2015 second quarter QPR submitted to the TSSWCB in July 2015)

Completed TWS Training
Confirmed Watershed, Date Scheduled
Obligated Watershed, Date Not Yet Scheduled
Suggested Watershed

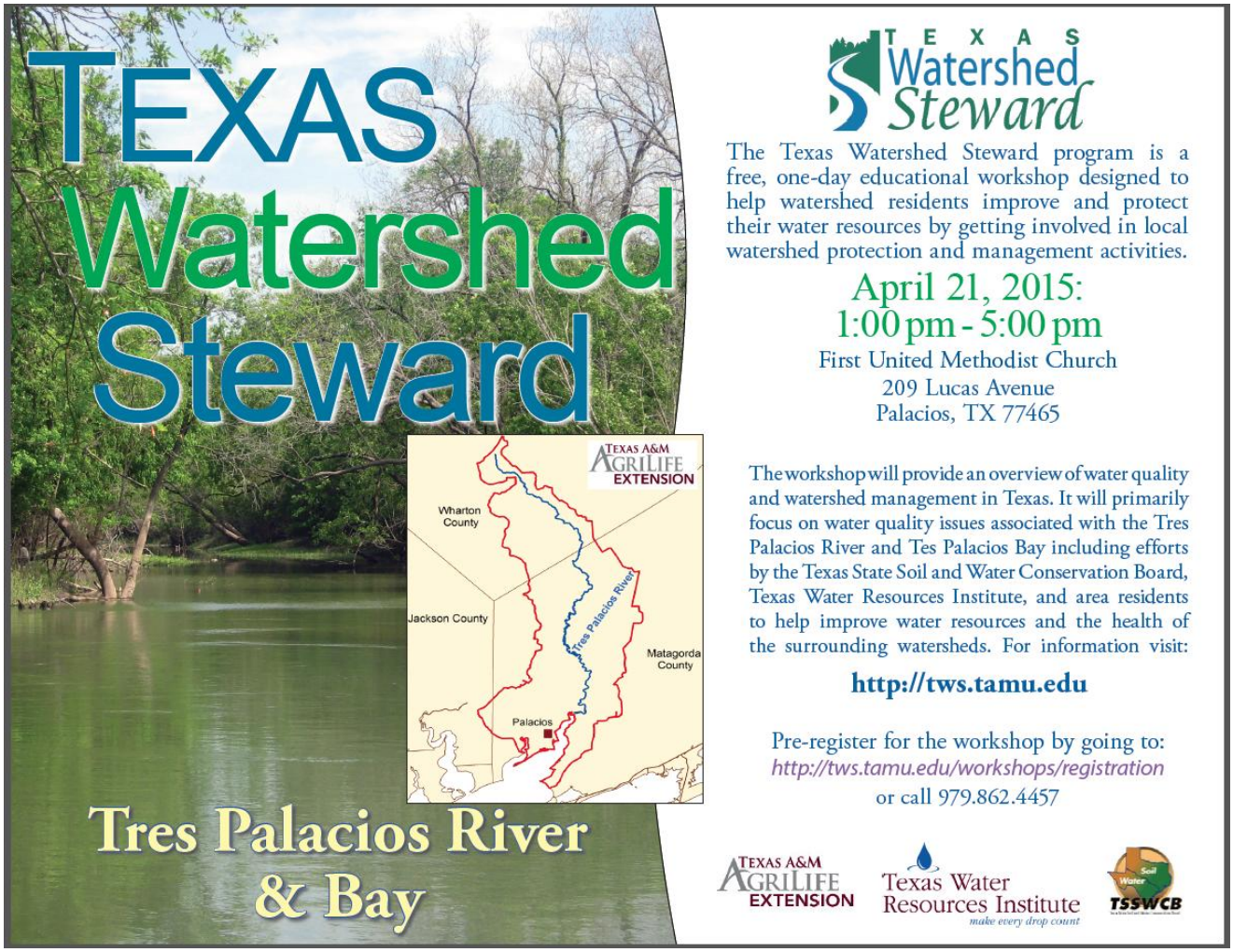
Texas State Soil and Water Conservation Board
Texas AgriLife Extension Service

Texas Watershed Steward Program
Tentative Schedule—Revised 6/30/2015

Watershed	Type	FY	Q	Date	City	County	Contact Name	Affiliation	Attended
Upper Neches		2014		2/17/2014	Tyler	Smith	Keith Hansen	AgriLife Extension	39
Angelina River		2014		2/18/2014	Nacogdoches	Nacogdoches	Wade Ross	TSFR - CBO	55
Medina River	Other	2014		3/22/2014	Bandera	Bandera	Dave Mauk	BCRAGD	65
Richland-Chambers Reservoir	Other	2014		4/15/2014	Ennis	Ellis	Blake Alldredge	AgriLife Extension	28
Lavaca Navidad Basins	Other	2014		5/22/2014	Victoria	Lavaca	Matt Brown	TWRI	51
Onion Creek/Barton Springs	WPP	2014		7/17/2014	Dripping Springs	Hays	Christy Muse	HCA and BSEACD	35
Oso Creek/Bay	TMDL	2015		12/4/2014	Corpus Christi	Nueces	Rocky Freund	NRA, TCEQ	39
Mill Creek	WPP	2015		1/9/2015	Bellville	Austin	Philip Shackelford	Agrilife Extension	44
Urban Houston/Clear Creek Watershed	Other	2015		3/3/2015	Friendswood	Harris	Emilie Oliver	Clear Creek ISD, Clear Brook High School	42
Leon River	WPP	2015		3/25/2015	Dublin	Erath	Mike Marshall	IRNR	37
Tres Palacios Creek/Bay	WPP	2015		4/21/2015	Palacios	Matagorda	Brent Bachelor and Allen Berthold	TWRI and AgriLife Extension	29
Navasota River	WPP	2015		5/7/2015	Kosse	Limestone	Lucas Gregory	TWRI	22
Lake Granbury	WPP	2015		6/23/2015	Granbury	Hood	Jody Cason	AgriLife Research	34
Dickinson Bayou	WPP/TMDL	2015		7/21/2015	League City	Galveston	Charriss York, Terri Berry, & Phoenix Rogers	Texas Sea Grant	
Brownsville Resaca	WPP	2016		Sep-15	Brownsville area	Cameron	Jaime Flores; Kyle Girten	TWRI and TCEQ	
Austin Urban Watersheds	Other	2016		10/15/2015	Austin	Travis	Zach Holbrooks	Texas Environmental Health Association	
Geronimo and Alligator Creeks	WPP	2015		Fall 2015	TBD	TBD	Ward Ling	AgriLife Extension	
Lake O' the Pines	WPP	2016			Jefferson	Marion	Lucas Gregory	TWRI, NRCS National Water Quality Innitiative, TSSWCB	
Little River Watershed	WPP	2016		Spring 2016			Allan Berthold	TWRI and TCEQ	
Comal/Dry Comal River Watershed	WPP	2016		Spring 2016				TCEQ	
Copano Bay & Mission & Aransas Rivers	TMDL				Refugio	Refugio	Allan Berthold; Roger Miranda	TCEQ and TWRI	
Dallas Urban Watersheds	Other	2016					Dottie Woodson; Dr. Fouad Jaber	AgriLife Extension	
Lake Arlington/Village Creek Watershed	WPP								
San Jacinto River Watersehd	WPP								
Armand Bayou	WPP				Pasadena Armand Bayou Nature Center	Harris	Linda Shead	Shead Conservation Solutions	
Chocolate Bayou	Other				Alvin	Brazoria	Steven Johnston	GBEP	
Middle Trinity River	WPP				Palestine	Anderson	Blake Alldredge	Trinity Waters	
Pecos River	WPP				Pecos	Reeves	Lucas Gregory	TWRI	
Plum Creek 3	WPP				Lockhart	Caldwell	Nick Domak	Plum Creek Watershed Partnership	
Red River	Other				Texarkana	Bowie	Mike Daniels	Arkansas Extension	
San Antonio River, Lower	Other				Goliad	Goliad	Steve Lusk	SARA	

Appendix B

Example TWS event flyer and press release



today.agrilife.org http://today.agrilife.org/2015/05/29/water-training-lake-granbury/

Water quality training June 23 will focus on Lake Granbury

View all articles by Paul Schattenberg
→

May 29, 2015

GRANBURY, Texas – A Texas Watershed Steward workshop on water quality issues related to Lake Granbury will be held from 1-5 p.m. June 23 at the Granbury Resort Conference Center, 621 E.State Loop 426 in Granbury.

The workshop is presented by the Texas A&M AgriLife Extension Service and the Texas State Soil and Water Conservation Board in cooperation with Texas A&M AgriLife Research.

The training is free and open to anyone interested in improving water quality in the region, said program coordinators. Participants are encouraged to preregister at http://tws.tamu.edu.

"This training is designed to help watershed residents improve and protect their water resources by becoming involved in local watershed protection and management activities," said Michael Kuitu, AgriLife Extension program specialist and coordinator for the Texas Watershed Steward program, College Station.

A free Texas Watershed Steward workshop will be presented from 1-5 pm. June 23 at the Lake Granbury Resort Conference Center. (Texas A&M AgriLife Extension Service photo)

Kuitu said the workshop will include an overview of water quality and watershed management in Texas, but will primarily focus on area water quality issues, including current efforts to help improve and protect Lake Granbury.

The training will include a discussion of watershed systems, types and sources of water pollution, and ways to improve and protect water quality. There also will be a group discussion on community-driven watershed protection and management.

"The supportive role Lake Granbury plays in regards to regional water supplies, wildlife habitat, agriculture, industry and recreation is vital. It is a truly important water resource," said Jody Cason, Granbury, AgriLife Research project manager and watershed coordinator for Lake Granbury.

"Participating in the Texas Watershed Steward program is a great opportunity to get involved and make a difference in your watershed while receiving program materials and even continuing education credits at no cost," said Marty Vahlenkamp, AgriLife Extension agent for Hood County.

Attendees of the training will receive a copy of the Texas Watershed Steward Handbook and a certificate of completion.

The program offers four continuing education units in soil and water management for certified crop advisers; four units for professional engineers, professional geoscientists and certified planners; four credits for certified teachers; and two credits for nutrient management specialists.

It also offers three general continuing education units for Texas Department of Agriculture pesticide license holders, four for certified landscape architects and three for certified floodplain managers.

Four continuing education credits are offered for each of the following Texas Commission on Environmental Quality occupational licenses: wastewater system operators, public water system operators, on-site sewage facility installers and landscape irrigators.

Vahlenkamp said he wants to encourage local residents and other stakeholders to attend the workshop to gain more information about water resources and water quality improvement and protection.

For more information, contact Kuitu at 979-862-4457, michael.kuitu@ag.tamu.edu, or Vahlenkamp at 817-579-3280, m-vahlenkamp@tamu.edu.

For more information about watershed protection efforts for Lake Granbury, contact Cason at 817-408-2535, jody.cason@tamu.edu.

The Texas Watershed Steward program is funded through a Clean Water Act Section 319 nonpoint source grant from the Texas State Soil and Water Conservation Board and U.S. Environmental Protection Agency.

-30-

Appendix C

Example TWS workshop invitation letter

Mr. Anyone
1111 Somewhere St.
Anytown, USA 11111

TEXAS A&M AGRILIFE EXTENSION

Dear Mr. Anyone,

Are you interested in the quality of water in your local streams, rivers and lakes? Would you like to learn about how to protect these important water resources? If so, join us at the Texas Watershed Steward workshop to be held at *VENUE NAME* located at *Address* in *CITY*, TX on *MONTH DAY* from *START TIME* to *END TIME*.

Texas Watershed Stewards is a one-day educational program sponsored by the Texas A&M AgriLife Extension Service, and Texas State Soil and Water Conservation Board, in coordination with the *LISTER OTHER EVENT/PROJECT PARTNERS*. The program is designed to improve the quality of Texas' water resources by educating and informing local stakeholders about their watershed, potential impairments, and steps that can be taken to help improve and protect water quality.

The focus of the workshop on *DATE* will be the *NAME OF WATERSHED* Watershed which includes parts of *COUNTY NAMES* Counties. *WATERSHED NAME* first appeared on the State's list of impaired waters in *DATE* for elevated levels of *IMPAIRMENT*.

Clean water is important to us all and as a landowner you play a key role in protecting local water resources for future generations. We hope you will take this opportunity to learn more about the water quality issues in your area and what you can do to help.

The training is free and you can pre-register for this event by visiting our website at http://tws.tamu.edu or by calling 979-862-4457.

As a part of the free training, we also offer Continuing Education Units for a variety of professions ranging from TDA (Texas Department of Agriculture) CEUs for pesticide license holders to select TCEQ (Texas Commission on Environmental Quality) Occupational license holders. For a complete list of CEUs offered, such as Professional Engineers, Certified Crop Advisors, Certified Planners, and more, visit our website or contact Michael Kuitu via the information given below.

If you have any questions or need more information about the workshop, please contact Michael Kuitu or *COUNTY AGENT'S NAME*.

We hope to see you there.

Michael Kuitu
Extension Program Specialist
979-862-4457
michael.kuitu@ag.tamu.edu

COUNTY AGENT'S NAME
COUNTY NAME County Extension Agent
PHONE NUMBER
EMAIL

Appendix D

Sample agenda for a TWS workshop

TEXAS WATERSHED STEWARD WORKSHOP: AGENDA

THURSDAY– DECEMBER 4, 2014

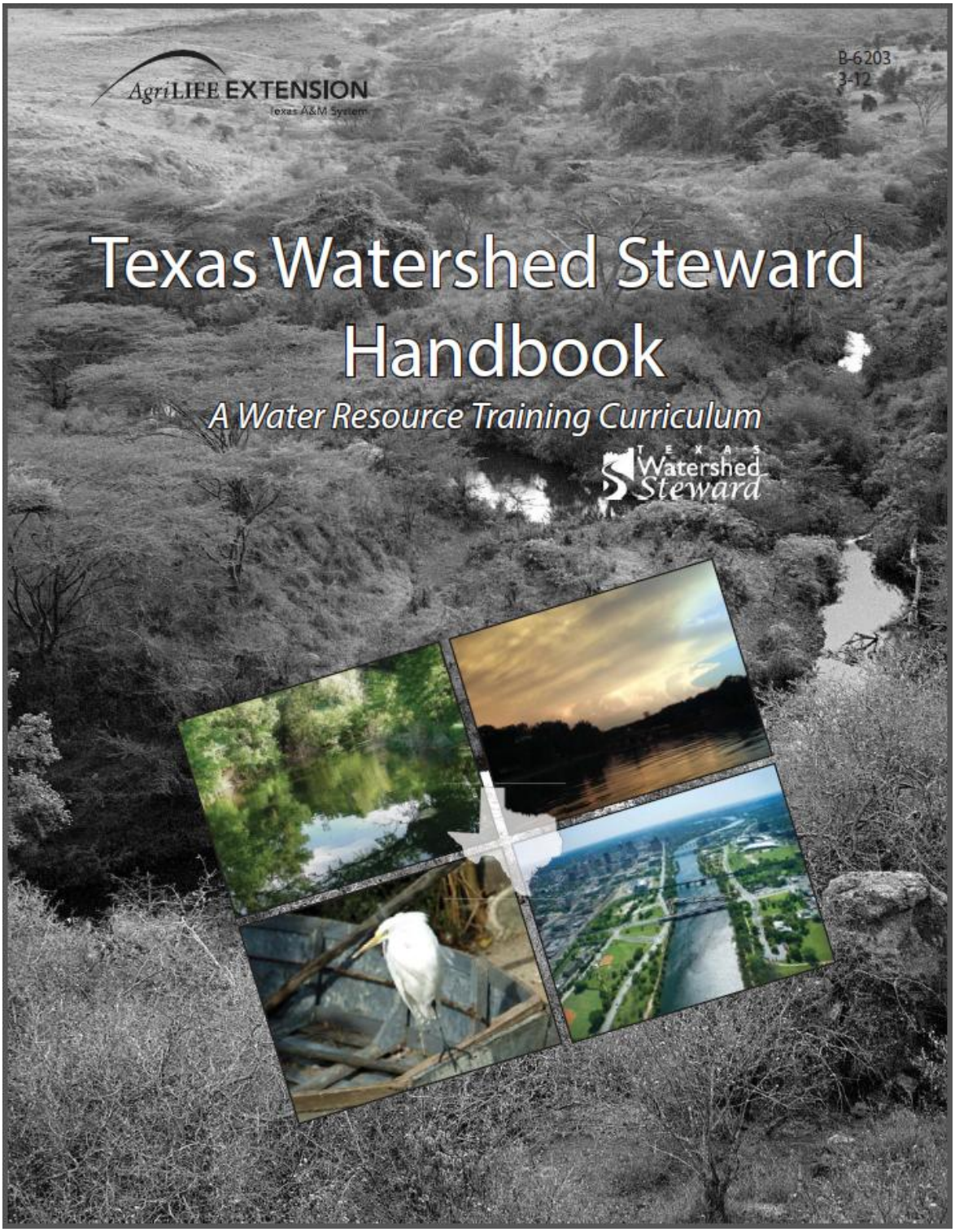
OSO CREEK & OSO BAY– DEL MAR COLLEGE

CORPUS CHRISTI, TX

Sign-In/Register/Coffee *Pre-test*
Introductions (of speakers and participants) ***Module 1: Program Introduction***
Module 2: Overview of Watershed Systems What is a Watershed? Watersheds in Texas How do Texans Use Watersheds? Principles of Watershed Hydrology Natural Watershed Features Natural Watershed Functions
Module 3: Overview of Watershed Impairments Water Quantity and Quality
BREAK
Module 3: Overview of Watershed Impairments Point and Nonpoint Sources of Pollution Consequences of Impaired Water Quality Water Quality Law and Policy in Texas Water Quality Testing, Monitoring and Regulation
Module 4: Managing to Improve Watershed Function Using a Watershed Approach Water Quality Improvement Projects Agricultural Best Management Practices Water Quality Stewardship on Small Acreages Management of Non-domestic Animals and Wildlife Urban Best Management Practices Protecting Water Quality Around the Home
Group Discussion ***Module 5: Community-Driven Watershed Protection and Management*** Importance of Local Watershed Involvement Forming and Sustaining Community Watershed Organizations and Partnerships
Questions, Discussions, Conclusions
Post-Test

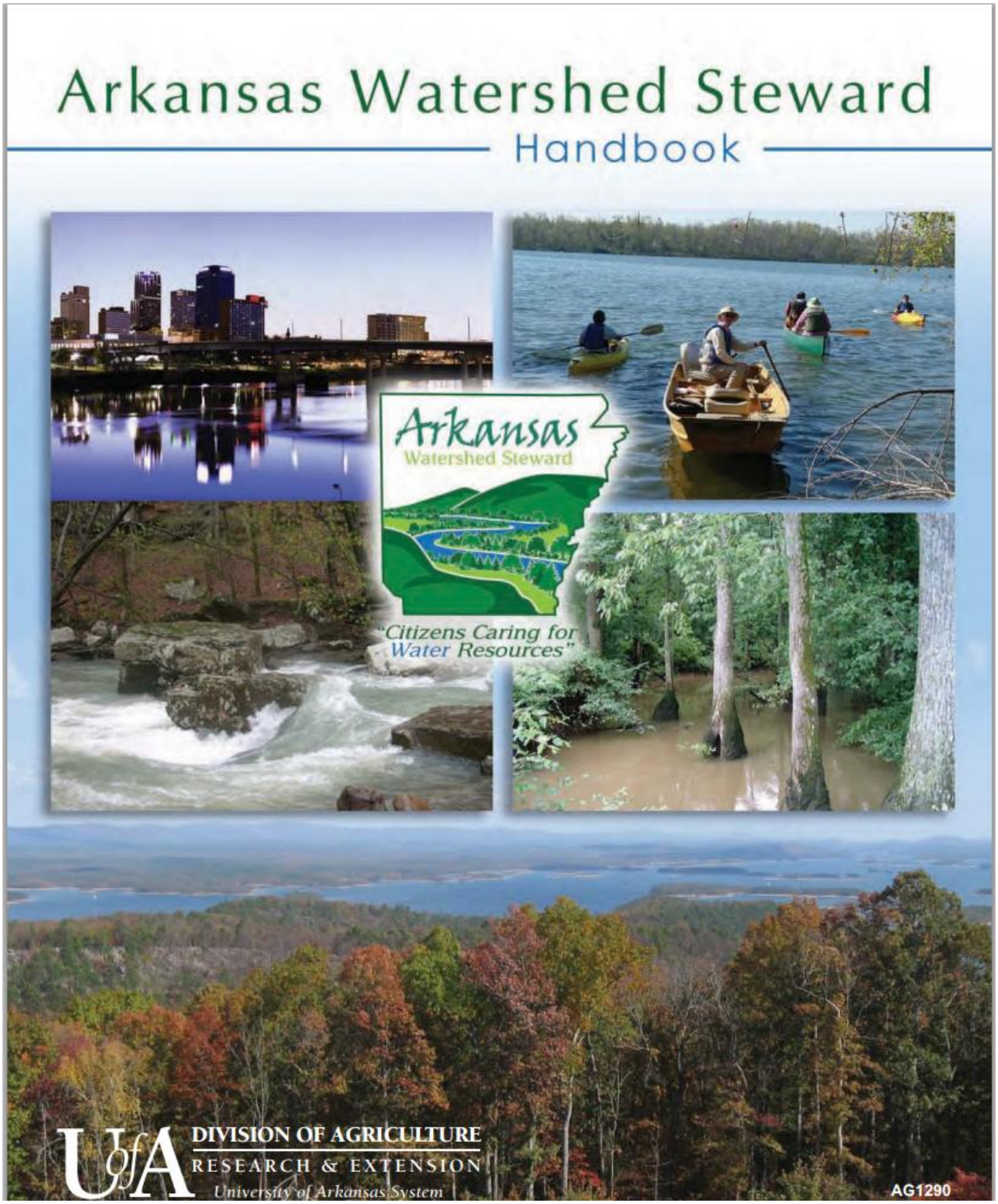
Appendix E

Cover page of TWS Curriculum Handbook



Appendix F

Cover page of Arkansas Watershed Steward Handbook

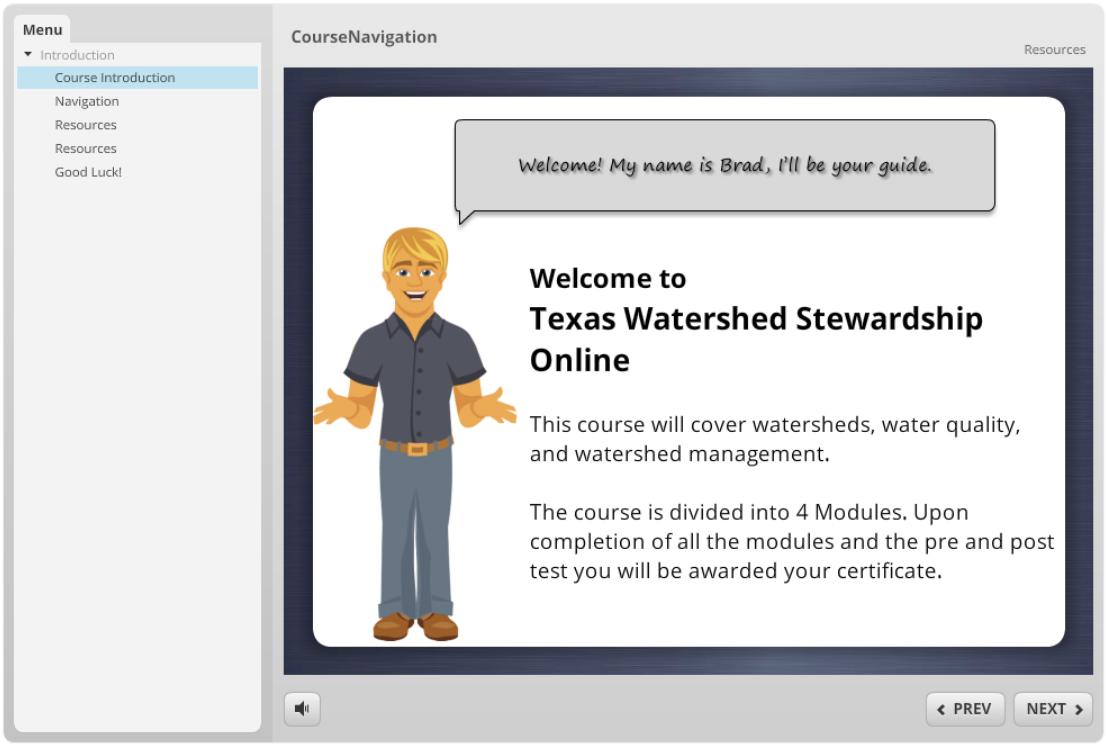


Appendix G

Surface water quality sampling demonstration along Clear Creek in Friendswood, TX (demonstration performed by the Houston-Galveston Area Council and Texas A&M AgriLife Extension)

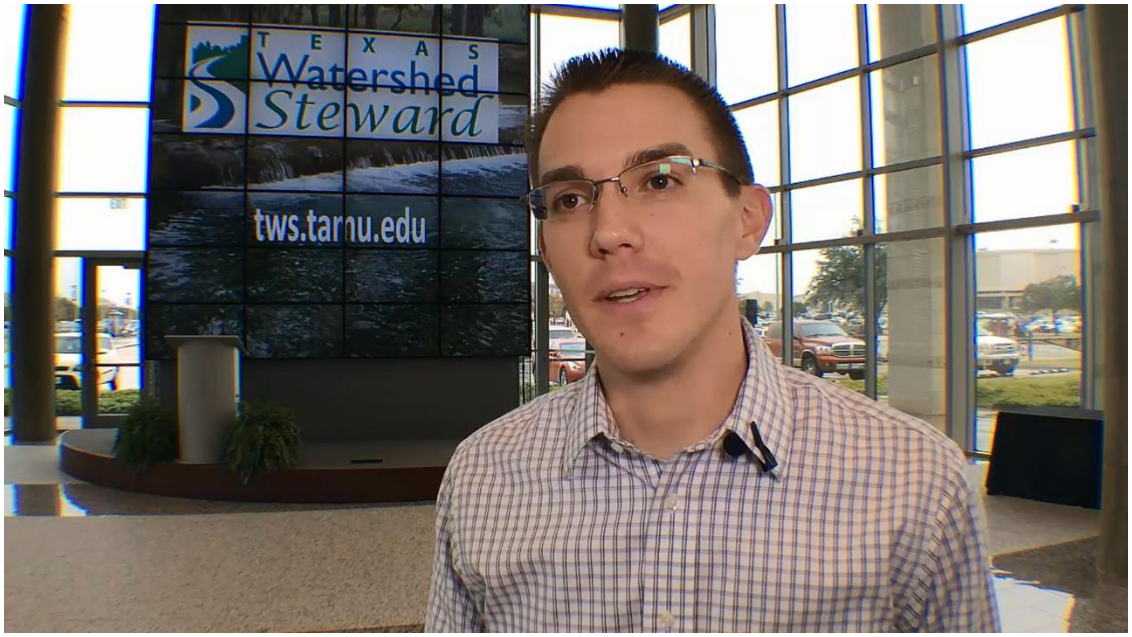
Appendix H

Welcome page of the online TWS course



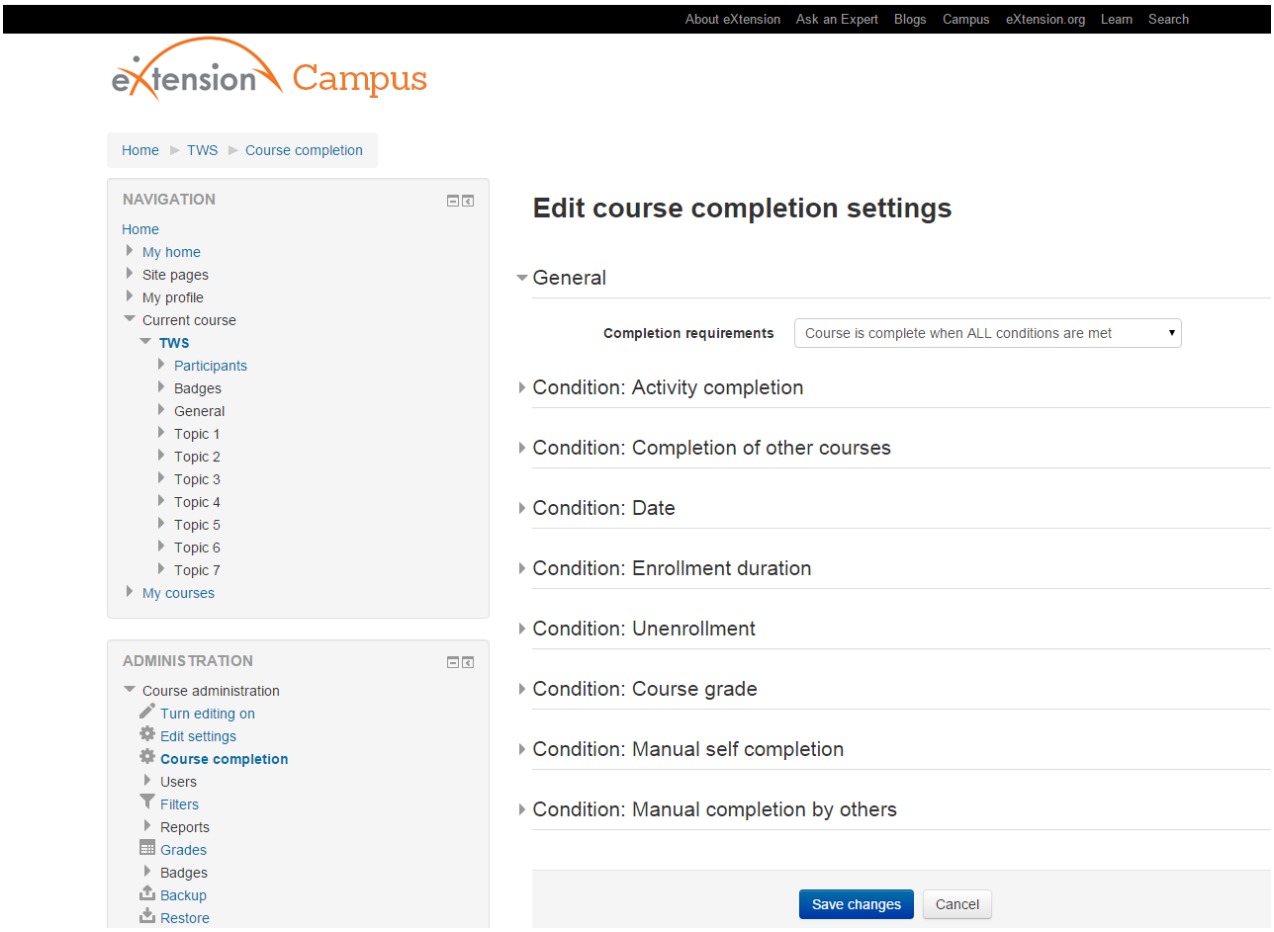
Appendix I

Clip from video press release for TWS program



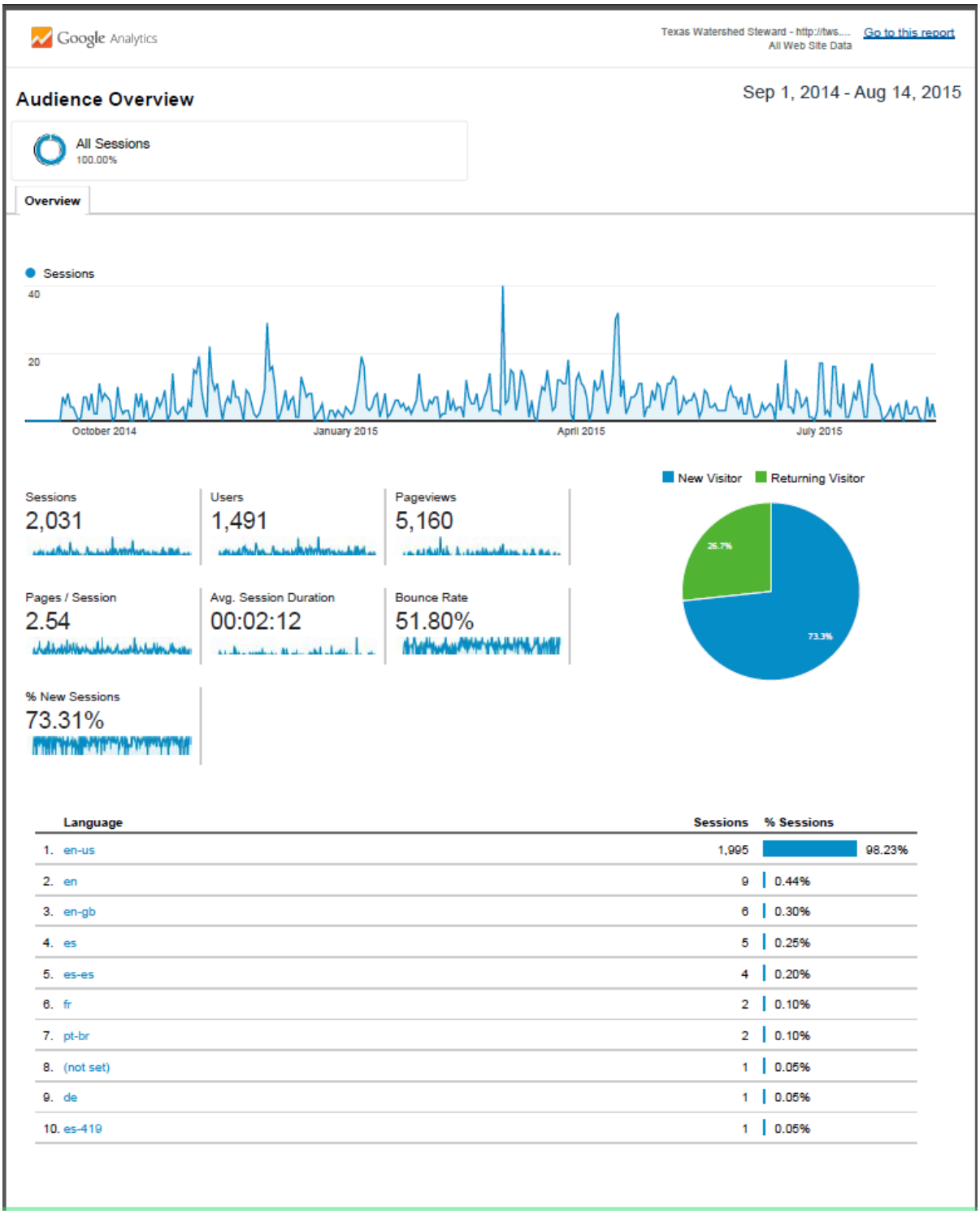
Appendix J

Instructor page for online course



Appendix K

Example cover page from Google Analytics report for TWS website



Appendix L

TWS program Pre- and Post-Tests

TEXAS A&M AGRILIFE EXTENSION

TEXAS Watershed Steward

Last 4 digits of your home phone number: | | | | |

Location of Training: _____

TEXAS WATERSHED STEWARD PROGRAM
Pretest

The purpose of this pretest is to help us learn more about you and to determine baseline data on watershed related information. Please read the following questions and circle the answer you think is correct . Please do not worry if you do not know the answer, simply circle "unsure." THANKS!!!

MARKING INSTRUCTIONS
CORRECT: ● INCORRECT: Ø ⊘ ⊜ ⊖

1. **Watershed hydrology is the study of how:**
   - O Water interacts with various parts of a watershed including the land, the sea, and the sky
   - O Water quality and quantity are affected by point and nonpoint source pollution
   - O Chemical, physical, and biological water quality parameters change over time
   - O Water is formed on the Earth
   - O Unsure

2. **pH is measured on a scale of:**
   - O 1-5
   - O 1-12
   - O 0-10
   - O 0-14
   - O 0-20
   - O Unsure

3. **All of the following are natural features found in healthy, functioning watersheds EXCEPT:**
   - O Upland
   - O Erosion zone
   - O Floodplain
   - O Riparian zone
   - O Water body
   - O Unsure

4. **The most commonly tested fecal bacteria indicator in freshwater is:**
   - O E. coli
   - O Cyanobacteria
   - O Streptococcus
   - O Giardia
   - O Cryptosporidium
   - O Unsure

30855

MARKING INSTRUCTIONS
CORRECT: ● INCORRECT: ⊘ ⊗ ⊖ ⊙

5. _____ is a term used to describe the chemical, physical, and biological characteristics of water.
   - O Water quantity
   - O Water clarity
   - O Water quality
   - O Water availability
   - O Unsure

6. Point source pollution refers to pollution that is discharged from a clearly defined, fixed point such as a pipe, ditch, channel, sewer, or tunnel.
   - O True O False O Unsure

7. The most common nonpoint source impairment in Texas is:
   - O Bacteria
   - O Dissolved oxygen
   - O Sediment
   - O Hazardous and Toxic Substances
   - O Unsure

8. All of the following are examples of major sources of nonpoint source pollution, EXCEPT:
   - O Bacteria
   - O Nutrients
   - O Algae
   - O Sediment
   - O Toxic Chemicals
   - O Unsure

9. Which nutrients most commonly cause water quality concerns?
   - O Nitrogen and Potassium
   - O Phosphorus and Sulfur
   - O Nitrogen and Sulfur
   - O Nitrogen and Phosphorus
   - O Phosphorus and Potassium
   - O Unsure

10. The over-enrichment of water with nutrients is called:
   - O Apnea
   - O Anoxia
   - O Aeration
   - O Eutrophication
   - O Hyperhydrosis
   - O Unsure

11. The Clean Water Act of 1972 was passed to:
   - O Protect the water quality of all of the nation's waterbodies
   - O Protect threatened and endangered plant and animal species
   - O Enable dredging in water bodies to prevent sedimentation and erosion
   - O Increase the funding for water treatment plants
   - O Unsure

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MARKING INSTRUCTIONS
CORRECT ● INCORRECT ⊘ ⊗ ⊖ ⊙

12. Water quality standards exist for surface water, wastewater effluent, and drinking water.

O True O False O Unsure

13. Which state agency is the primary water quality agency in Texas?

O Environmental Protection Agency (EPA)
O Texas Water Development Board (TWDB)
O Texas Commission on Environmental Quality (TCEQ)
O Texas State Soil and Water Conservation Board (TSSWCB)
O Unsure

14. A flexible framework for managing the quantity and quality of water resources found within specified watershed boundaries is referred to as:

O Environmental planning
O Watershed approach
O Restoration strategy
O Pollution control strategy
O Community action plan
O Unsure

15. Which of the following are important types of water quality improvement projects in Texas?

O A. Watershed protection plans (WPP)
O B. Water quality standards assessment
O C. Total maximum daily loads (TMDL)
O A and C
O B and C
O Unsure

16. Structural and non-structural practices used to protect water quality are referred to as:

O Environmental protection practices
O Best management practices
O Water restoration practices
O Unsure

17. The Clean Water Act Section _____ List is a list of streams and lakes that are impaired for one or more pollutants causing them to not meet state water quality standards.

O 404(a) O 303(d) O 615(b) O 208(b) O 503(b) O Unsure

18. The primary regulatory water quality monitoring program in Texas is:

O Texas Coastal Management Program
O Texas Stream Team
O Texas Coordinated Monitoring Program
O Texas Clean Rivers Program
O Texas Bay Monitoring Program
O Unsure

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MARKING INSTRUCTIONS
CORRECT: ● INCORRECT: Ø ⊘ ⊖ ⊙

19. Please tell us if any of the following items interest you.

ITEM	Not Interested	Possibly Interested	Probably Interested	Definitely Interested
A. Protecting my watershed	O	O	O	O
B. Participating in additional watershed education workshops or seminars	O	O	O	O
C. Becoming active in a local watershed group	O	O	O	O
D. Having a leadership role in a local watershed group	O	O	O	O
E. Participating in a volunteer water quality monitoring program	O	O	O	O

20. Please answer the following questions by marking YES or NO related to where you have received water quality information. If the question does, not apply, select "NA."

Have you received water quality information from the following sources?	Yes	No	NA
A. Television	O	O	O
B. Newspapers	O	O	O
C. Internet	O	O	O
D. Texas AgriLife Extension Service (formerly Texas Cooperative Extension)	O	O	O
E. Texas AgriLife Research (formerly Texas Agricultural Experiment Station)	O	O	O
F. Universities	O	O	O
G. Environmental Agencies (government)	O	O	O
H. Environmental groups (citizens groups)	O	O	O

21. How did you hear about the Texas Watershed Steward Program?

O Extension
O Newspaper
O Newsletter
O Internet
O Texas Coop Magazine
O Utility insert
O Friend
O Other: _____

22. How would you best describe yourself? (fill in one only)

O Agency professional
O City/county official/employee
O Non-governmental organization member/employee
O Teacher / educational professional
O Small business owner
O Other: _____

23. You are . . . O Female O Male

24. Your age? O 18 - 24 O 25 - 29 O 30 - 34 O 35 - 39 O 40 - 44 O 45 - 49 O 50 - 54 O 55 - 59 O 60 - 64 O 65 - 69 O 70 - 74 O 75+

25. Place of residence?
O Farm or ranch 0 - 100 acres
O Farm or ranch > 100 acres
O Rural area, not a farm / ranch
O Town under 10,000
O Town or city between 10,000 and 50,000 persons
O City between 50,000 and 250,000 persons
O City over 250,000 persons

26. Highest level of education obtained?

O Some high school or less
O High school graduate or GED
O Vocational or technical degree
O Some college
O Bachelor degree
O Post-graduate degree(s)

30855

THANK YOU!

TEXAS A&M AGRILIFE EXTENSION

TEXAS Watershed Steward

Last 4 digits of your home phone number: | | | | |

Location of Training: _____

TEXAS WATERSHED STEWARD PROGRAM
Post Test

Your views on the quality and effectiveness of Extension programs are extremely important. Please take a few minutes to tell us about your experience with this program. Your answers to the following questions will help us better meet your needs in the future. Thank you!

MARKING INSTRUCTIONS
CORRECT: ● INCORRECT: ⊘ ⊖ ⊖ ⊖

Overall, how satisfied are you with this activity?

○ Not at all ○ Slightly ○ Somewhat ○ Mostly ○ Completely

If not "Completely Satisfied," please tell us what we could have done better in order for you to be "Completely Satisfied?"

How satisfied are you with the following aspects of the activity?	Not at all	Slightly	Somewhat	Mostly	Completely
a. Quality of course materials	○	○	○	○	○
b. Location of the activity	○	○	○	○	○
c. Accuracy of information	○	○	○	○	○
d. Information being new to you	○	○	○	○	○
e. Information being easy to understand	○	○	○	○	○
f. Range of topics covered	○	○	○	○	○
g. Completeness of information given	○	○	○	○	○
h. Timeliness of information (being received in time to be useful)	○	○	○	○	○
i. Helpfulness of the information in decisions about your own situation	○	○	○	○	○
j. Instructor's knowledge level of subject matter	○	○	○	○	○
k. Instructor's responses to questions	○	○	○	○	○

Based on the information and technical assistance you received today, what is the likelihood that you would recommend Texas AgriLife Extension Service to your family and friends as a contact for information and assistance on water-related issues? ***Mark only one number below with 1 = not likely and 10 = likely.***

○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10

Not Likely **Likely**

49705

Please read the following questions and mark the answer you think is correct. Please do not worry if you do not know the answer, simply mark "unsure." THANKS!!!

MARKING INSTRUCTIONS
CORRECT ● INCORRECT ⊘ ⊗ ⊖ ⊖

1. **Watershed hydrology is the study of how:**
   - O Water interacts with various parts of a watershed including the land, the sea, and the sky
   - O Water quality and quantity are affected by point and nonpoint source pollution
   - O Chemical, physical, and biological water quality parameters change over time
   - O Water is formed on the Earth
   - O Unsure

2. **pH is measured on a scale of:**
   O 1-5 O 1-12 O 0-10 O 0-14 O 0-20 O Unsure

3. **All of the following are natural features found in healthy, functioning watersheds EXCEPT:**
   O Upland O Erosion zone O Floodplain O Riparian zone O Water body O Unsure

4. **The most commonly tested fecal bacteria indicator in freshwater is:**
   O E. coli O Cyanobacteria O Streptococcus O Giardia O Cryptosporidium O Unsure

5. **_____ is a term used to describe the chemical, physical, and biological characteristics of water.**
   O Water quantity O Water clarity O Water quality O Water availability O Unsure

6. **Point source pollution refers to pollution that is discharged from a clearly defined, fixed point such as a pipe, ditch, channel, sewer, or tunnel.**
   O True O False O Unsure

7. **The most common nonpoint source impairment in Texas is:**
   - O Bacteria
   - O Dissolved oxygen
   - O Sediment
   - O Hazardous and Toxic Substances
   - O Unsure

8. **All of the following are examples of major sources of nonpoint source pollution, EXCEPT:**
   O Bacteria O Nutrients O Algae O Sediment O Toxic Chemicals O Unsure

9. **Which nutrients most commonly cause water quality concerns?**
   - O Nitrogen and Potassium
   - O Phosphorus and Sulfur
   - O Nitrogen and Sulfur
   - O Nitrogen and Phosphorus
   - O Phosphorus and Potassium
   - O Unsure

10. **The over-enrichment of water with nutrients is called:**
    O Apnea O Anoxia O Aeration O Eutrophication O Hyperhydrosis O Unsure

49705

MARKING INSTRUCTIONS
CORRECT ● INCORRECT ⊘ ⊗ ⊖ ⊙

11. The Clean Water Act of 1972 was passed to:

- O Protect the water quality of all of the nation's waterbodies
- O Protect threatened and endangered plant and animal species
- O Enable dredging in water bodies to prevent sedimentation and erosion
- O Increase the funding for water treatment plants
- O Unsure

12. Water quality standards exist for surface water, wastewater effluent, and drinking water.

O True O False O Unsure

13. Which state agency is the primary water quality agency in Texas?

- O Environmental Protection Agency (EPA)
- O Texas Water Development Board (TWDB)
- O Texas Commission on Environmental Quality (TCEQ)
- O Texas State Soil and Water Conservation Board (TSSWCB)
- O Unsure

14. A flexible framework for managing the quantity and quality of water resources found within specified watershed boundaries is referred to as:

- O Environmental planning
- O Watershed approach
- O Restoration strategy
- O Pollution control strategy
- O Community action plan
- O Unsure

15. Which of the following are important types of water quality improvement projects in Texas?

- O A. Watershed protection plans (WPP)
- O B. Water quality standards assessment
- O C. Total maximum daily loads (TMDL)
- O A and C
- O B and C
- O Unsure

16. Structural and non-structural practices used to protect water quality are referred to as:

- O Environmental protection practices
- O Best management practices
- O Water restoration practices
- O Unsure

17. The Clean Water Act Section _____ List is a list of streams and lakes that are impaired for one or more pollutants causing them to not meet state water quality standards.

O 404(a) O 303(d) O 615(b) O 208(b) O 503(b) O Unsure

18. The primary regulatory water quality monitoring program in Texas is:

- O Texas Coastal Management Program
- O Texas Stream Team
- O Texas Coordinated Monitoring Program
- O Texas Clean Rivers Program
- O Texas Bay Monitoring Program
- O Unsure

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MARKING INSTRUCTIONS
CORRECT: ● INCORRECT: ⊘ ⊗ ⊖ ⊙

19. Please indicate your intentions to do the following:

Practice related to . . .	Definitely Will Not	Probably Will Not	Undecided	Probably Will	Definitely Will	Already Adopted
A. Participate in community cleanup activities	O	O	O	O	O	O
B. Get involved in local planning / zoning decisions	O	O	O	O	O	O
C. Communicate water issues with elected officials	O	O	O	O	O	O
D. Help develop a plan for my watershed (WPP)	O	O	O	O	O	O
E. Help form or become a member of a local watershed group	O	O	O	O	O	O

20. Are there any Best Management Practices (BMPs) that you plan to adopt to help protect your watershed?

O Yes O No O Unsure

if yes, please list the ones you plan to adopt in the space below

21. Do you feel what you learned in the program provided you the ability to be a better steward of your watershed?

O Yes O No O Unsure

22. What is the most significant thing you learned during the program (feel free to list more than one)?

23. How much would you be willing to pay for this program?

O $0 - $9 O $30 - $39 O $60 - $69 O $90 - $100
O $10 - $19 O $40 - $49 O $70 - $79
O $20 - $29 O $50 - $59 O $80 - $89

24. What other information do you need pertaining to these topics?

49705

THANK YOU!

Appendix M

TWS 6-month Post-Evaluation questions

Have you:

Participated in at least one community cleanup event?

Gotten involved in local planning/zoning decisions?

Communicated water issues with elected officials?

Helped develop a plan for your watershed (Watershed Protection Plan)?

Helped form or become a member of a local watershed group?

Gotten involved in a volunteer water quality monitoring program?

Given a presentation to a school class or other community group on watershed stewardship/water quality?

Encouraged others in your community to attend a TWS workshop?

More closely monitored individual actions that can impair water quality?

Adopted/maintained Best Management Practices (BMPs) on your property or in your community related to water quality/conservation/management?

Adopted soil testing practices?

Have you used the resourced/materials provided to you at the workshop?

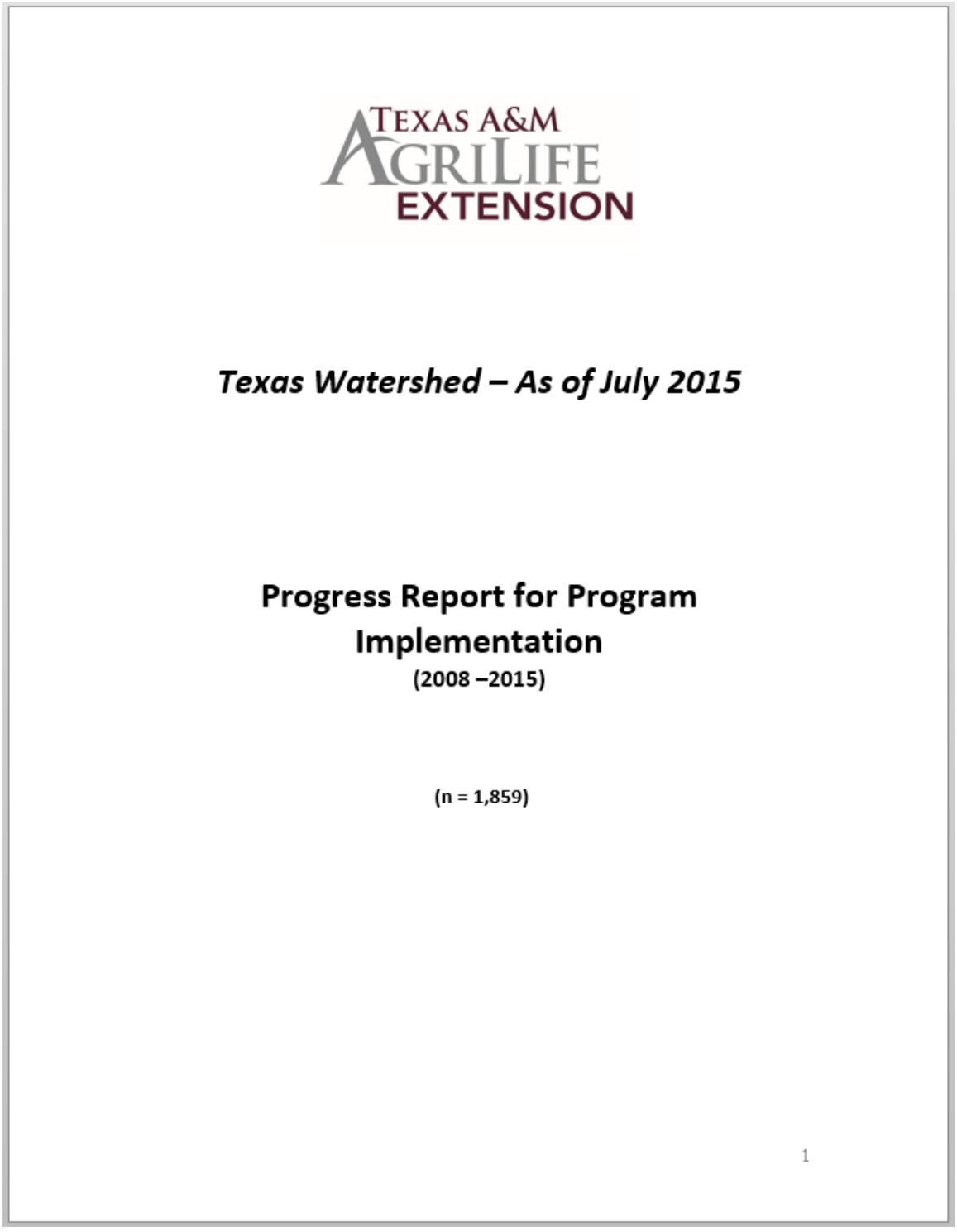
Have you shared the resources/materials provided to you at the workshop with others?

Were you satisfied with the resources/materials provided to you at the workshop?

Have you used the TWS on-line modules available at http://tws.tamu.edu/?

Appendix N

Phase 1 Evaluation (Pre/Post-Test) Data Report



TEXAS A&M AGRILIFE EXTENSION

Texas Watershed – As of July 2015

Progress Report for Program Implementation

(2008 –2015)

(n = 1,859)

1

Summary provided by Paul Pope (ppope@tamu.edu)

Summary. Listed below are some of the highlights of the pretest and posttest from the Texas Watershed Program.

KNOWLEDGE (using designated knowledge gain questions only)

- There was an overall knowledge increase of ***+34.0*** percentage points from the pretest and post test for questions (original and revised questions combined).
- For *watersheds* questions, there was an overall knowledge increase of **+28.8** percentage points from the pretest and post test (original and revised questions combined).
- For *fresh water* questions, there was an overall knowledge increase of ***+39.7*** percentage points from the pretest and post test (original and revised questions combined).
- For *pollution* questions, there was an overall knowledge increase of ***+36.8*** percentage points from the pretest and post test (original and revised questions combined).
- For *policy and government* questions, there was an overall knowledge increase of ***+36.1*** percentage points from the pretest and post test (original and revised questions combined).

INTENTIONS TO CHANGE

- **343 of 1,558 (22.0%)** said they intend to participate in community cleanup activities. **315** (**20.2%**) said they have already done this before the program.
- **313 of 1,548 (20.2%)** said they intend to get involved in local planning / zoning decisions. **207** (**13.4%**) said they have already done this before the program.
- **455 of 1,557 (29.2%)** said they intend to communicate water issues with elected officials. **236** (**15.2%**) said they have already done this before the program.
- **358 of 1,550 (23.1%)** said they intend to help develop a plan for my watershed. **159** (**10.3%**) said they have already done this before the program.
- **318 of 1,554 (20.5%)** said they to help form or become a member of a local watershed group. **193** (**12.4%**) said they have already done this before the program.

OTHER POST-EVENT MEASURES

- **1,001 of 1,533 (65.3%)** said there were Best Management Practices (BMPs) that they plan to adopt to help them be a better steward of their watershed.
- **1,550 of 1,585 (97.8%)** felt what they learned provided them with the ability to be a better steward of their watershed.

Table 1. Pretest and post test results from trainings.

Question	Pretest Correct Response	Post Test Correct Response	Pct. Point Diff[1]
1. Watershed hydrology is the study of how:	732 of 1,272 (57.5%)	958 of 1,272 (75.3%)	+17.8
2. pH is measured on a scale of:	848 of 1,272 (66.7%)	1,222 of 1,272 (96.1%)	+29.4
3. All of the following are natural features found in healthy, functioning watersheds EXCEPT:	554 of 1,272 (43.6%)	998 of 1,272 (78.5%)	+34.9
4. The most commonly tested fecal bacteria indicator in freshwater is:	977 of 1,272 (76.8%)	1,177 of 1,272 (92.5%)	+15.7
5. _____ is a term used to describe the chemical, physical, and biological characteristics of water.	1,010 of 1,272 (79.4%)	1,157 of 1,272 (91.0%)	+11.6
6. Point source pollution refers to pollution that is discharged from a clearly defined, fixed point such as a pipe, ditch, channel, . . .	1,091 of 1,272 (85.8%)	1,231 of 1,272 (96.8%)	+11.0
7. The most common nonpoint source impairment in Texas is:	241 of 1,272 (18.9%)	857 of 1,272 (67.4%)	+48.5
8. All of the following are examples of major sources of nonpoint source pollution, EXCEPT:	342 of 1,272 (26.9%)	920 of 1,272 (72.3%)	+45.4
9. Which nutrients most commonly cause water quality concerns?	748 of 1,272 (58.8%)	1,069 of 1,272 (84.0%)	+25.2
10. The over-enrichment of water with nutrients is called:	729 of 1,272 (57.3%)	1,049 of 1,272 (82.5%)	+25.2
11. The Clean Water Act of 1972 was passed to:	1074 of 1,272 (84.4%)	1,242 of 1,272 (97.6%)	+13.2
12. The three types of water quality standards established by the Clean Water Act are surface water, effluent, and drinking water quality standards.	986 of 1,272 (77.5%)	1,185 of 1,272 (93.2%)	+15.7
13. Which state agency is the primary water quality agency in Texas	769 of 1,272 (60.5%)	1,106 of 1,272 (86.9%)	+26.4
14. A flexible framework for managing the quantity and quality of water resources found within specified watershed boundaries is referred to as:	727 of 1,272 (57.2%)	1,056 of 1,272 (83.0%)	+25.8
15. Which of the following are important types of water quality improvement projects in Texas?	526 of 1,272 (41.4%)	1,032 of 1,272 (81.1%)	+39.7
16. Structural and non-structural practices used to protect water quality are referred to as:	757 of 1,272 (59.5%)	1,113 of 1,272 (87.5%)	+28.0
17. The Clean Water Act Section _____ List is a list of streams and lakes that are impaired for one or more pollutants causing them to not meet state water quality standards.	589 of 1,272 (46.3%)	1,229 of 1,272 (96.6%)	+50.3
18. The primary regulatory water quality monitoring program in Texas is:	569 of 1,272 (44.7%)	848 of 1,272 (66.7%)	+22.0
OVERALL	**13,269 of 22,896 (58.0%)**	**19,449 of 22,896 (84.9%)**	**+26.9**
KNOWLEDGE GAIN QUESTIONS (2, 3, 7-10, 14-18)	**6,630 of 13,992 (47.4%)**	**11,393 of 13,992 (81.4%)**	**+34.0**

[1]Percentage point change was calculated by the following formula: After % – Before %

Table 2. Pretest and post test results from questions pertaining to "Watersheds."

Question	Pretest Correct	Post Test Correct	Pct. Point Chg[1]
1. Watershed hydrology is the study of how:	732 of 1,272 (57.5%)	958 of 1,272 (75.3%)	**+17.8**
2. pH is measured on a scale of:	848 of 1,272 (66.7%)	1,222 of 1,272 (96.1%)	**+29.4**
3. All of the following are natural features found in healthy, functioning watersheds EXCEPT:	554 of 1,272 (43.6%)	998 of 1,272 (78.5%)	**+34.9**
10. The over-enrichment of water with nutrients is called:	729 of 1,272 (57.3%)	1,049 of 1,272 (82.5%)	**+25.2**
14. A flexible framework for managing the quantity and quality of water resources found within specified watershed boundaries is referred to as:	727 of 1,272 (57.2%)	1,056 of 1,272 (83.0%)	**+25.8**
OVERALL – Watersheds	**3,590 of 6,360 (56.4%)**	**5,283 of 6,360 (83.1%)**	**+26.7**
KNOWLEDGE GAIN QUESTIONS (2, 3, 10, 14)	**2,858 of 5,088 (56.2%)**	**4,325 of 5,088 (85.0%)**	**+28.8**

[1]Percentage point change was calculated by the following formula: After % – Before %

Table 3. Pretest and post test results from questions pertaining to "Fresh Water."

Question	Pretest Correct	Post Test Correct	Pct. Point Chg[1]
4. The most commonly tested fecal bacteria indicator in freshwater is:	977 of 1,272 (76.8%)	1,177 of 1,272 (92.5%)	**+15.7**
5. _____ is a term used to describe the chemical, physical, and biological characteristics of water.	1,010 of 1,272 (79.4%)	1,157 of 1,272 (91.0%)	**+11.6**
15. Which of the following are important types of water quality improvement projects in Texas?	526 of 1,272 (41.4%)	1,032 of 1,272 (81.1%)	**+39.7**
OVERALL – Fresh Water	**2,513 of 3,816 (65.9%)**	**3,366 of 3,816 (88.2%)**	**+22.3**
KNOWLEDGE GAIN QUESTIONS (15)	526 of 1,272 (41.4%)	1,032 of 1,272 (81.1%)	**+39.7**

[1]Percentage point change was calculated by the following formula: After % – Before %

Table 4. Pretest and post test results from questions pertaining to "Pollution."

Question	Pretest Correct	Post Test Correct	Pct. Point Chg[1]
6. Point source pollution refers to pollution that is discharged from a clearly defined, fixed point such as a pipe, ditch, channel, . . .	1,091 of 1,272 (85.8%)	1,231 of 1,272 (96.8%)	**+11.0**
7. The most common nonpoint source impairment in Texas is:	241 of 1,272 (18.9%)	857 of 1,272 (67.4%)	**+48.5**
8. All of the following are examples of major sources of nonpoint source pollution, EXCEPT:	342 of 1,272 (26.9%)	920 of 1,272 (72.3%)	**+45.4**
9. Which nutrients most commonly cause water quality concerns?	748 of 1,272 (58.8%)	1,069 of 1,272 (84.0%)	**+25.2**
16. Structural and non-structural practices used to protect water quality are referred to as:	757 of 1,272 (59.5%)	1,113 of 1,272 (87.5%)	**+28.0**
OVERALL – Pollution	**3,179 of 6,360 (50.0%)**	**5,090 of 6,360 (81.6%)**	**+31.6**
KNOWLEDGE GAIN QUESTIONS (7-9, 16)	**2,088 of 5,088 (41.0%)**	**3,864 of 5,088 (77.8%)**	**+36.8**

[1]Percentage point change was calculated by the following formula: After % – Before %

Table 5. Pretest and post test results from questions pertaining to "Policy and Govt."

Question	Pretest Correct	Post Test Correct	Pct. Point Chg[1]
11. The Clean Water Act of 1972 was passed to:	1074 of 1,272 (84.4%)	1,242 of 1,272 (97.6%)	**+13.2**
12. The three types of water quality standards established by the Clean Water Act are surface water, effluent, and drinking water quality standards.	986 of 1,272 (77.5%)	1,185 of 1,272 (93.2%)	**+15.7**
13. Which state agency is the primary water quality agency in Texas	769 of 1,272 (60.5%)	1,106 of 1,272 (86.9%)	**+26.4**
17. The Clean Water Act Section _____ List is a list of streams and lakes that are impaired for one or more pollutants causing them to not meet state water quality standards.	589 of 1,272 (46.3%)	1,229 of 1,272 (96.6%)	**+50.3**
18. The primary regulatory water quality monitoring program in Texas is:	569 of 1,272 (44.7%)	848 of 1,272 (66.7%)	**+22.0**
OVERALL - Policy and Government	**3,987 of 6,360 (62.7%)**	**5,610 of 6,360 (88.2%)**	**+25.5**
KNOWLEDGE GAIN QUESTIONS (17, 18)	**1,158 of 2,544 (45.5%)**	**2,077 of 2,544 (81.6%)**	**+36.1**

[1]Percentage point change was calculated by the following formula: After % – Before %

Table 6. Intentions to change[1].

Statement	Probably Will	Definitely Will	Combined Percent
Your intentions to participate in community cleanup activities (n= *1,558*).	**(41.3%)**	**(22.0%)**	*63.4*%
Your intentions to get involved in local planning / zoning decisions (n= *1,548*)	**(35.0%)**	**(20.2%)**	*55.2*%
Your intentions to communicate water issues with elected officials (n= *1,557*)	**(34.9%)**	**(29.2%)**	*64.1*%
Your intentions to help develop a plan for my watershed (n= *1,550*)	**(34.2%)**	**(23.1%)**	*57.3*%
Your intentions to help form or become a member of a local watershed group (n= *1,554*)	**(34.0%)**	**(20.5%)**	*54.5*%

[1]Likert scale defined as 1 = *definitely will not*, 2 = *probably will not*, 3 = *undecided*, 4 = *probably will*, and 5 = *definitely will*.

Table 7. Satisfaction[1].

Statement	Mostly	Completely	Combined Percent
Overall, how satisfied are you with this activity? (n= *1,482*)	(28.2%)	(69.9%)	*98.1*%
How satisfied were you with the quality of course materials? (n= *1,597*)	(22.8%)	(76.1%)	*98.9*%
How satisfied were you with the location of activity? (n= *1,599*)	(20.8%)	(72.4%)	*93.2*%
How satisfied were you with the accuracy of information? (n= *1,575*)	(23.5%)	(74.7%)	*98.2*%
How satisfied were you with the information being new to you? (n= *1,584*)	(32.4%)	(25.9%)	*58.3*%
How satisfied were you with the information being easy to understand? (n= *1,591*)	(31.9%)	(64.2%)	*96.1*%
How satisfied were you with the range of topics covered? (n= *1,592*)	(33.0%)	(63.5%)	*96.5*%
How satisfied were you with the completeness of information given? (n= *1,592*)	(32.3%)	(64.1%)	*96.4*%
How satisfied were you with the timeliness of information (being received in time to be useful)? (n= *1,588*)	(28.7%)	(66.1%)	*94.7*%
How satisfied were you with the helpfulness of the information in decisions about your own situation? (n= *1,584*)	(34.5%)	(55.9%)	*90.3*%
How satisfied were you with the instructor's knowledge level of subject matter? (n= *1,591*)	(17.0%)	(82.0%)	*99.0*%
How satisfied were you with the instructor's responses to questions? (n= *1,591*)	(19.7%)	(78.5%)	*98.2*%

[1]Likert scale defined as 1 = *not at all*, 2 = *slightly*, 3 = *somewhat*, 4 = *mostly*, and 5 = *completely*.

Other Data

- **53.1%** said they have received water quality information from television.
- **64.2%** said they have received water quality information from newspapers.
- **74.3%** said they have received water quality information from the Internet.
- **62.2%** said they have received water quality information from Texas A&M AgriLife Extension Service.
- **40.6%** said they have received water quality information from Texas A&M AgriLife Research.
- **52.8%** said they have received water quality information from universities.
- **72.1%** said they have received water quality information from Environmental Agencies (government).
- **56.2%** said they have received water quality information from Environmental groups (citizens)

Appendix O

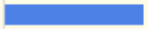
Phase 2 Evaluation (6-month Post-Evaluation) Data Report

Phase 2 Evaluation (6-month Post-Evaluation) Data Report

Report creation date: August 17, 2015 n=228 started 185 completed

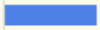
1. Please tell us if you adopted any of the following practices below based on what you learned at the Texas Watershed Steward Workshop.

Participated in at least one community cleanup event.

#	Answer		Response	%
1	I am still undecided		13	7%
2	NO, and I don't plan to		15	8%
3	NO, but I still plan to		77	40%
4	YES, I did		88	46%
	Total		193	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	3.24
Variance	0.75
Standard Deviation	0.86
Total Responses	193

2. Gotten involved in local planning/zoning decisions

#	Answer		Response	%
1	I am still undecided		24	12%
2	NO, and I don't plan to		38	20%
3	NO, but I still plan to		51	26%
4	YES, I did		80	41%
	Total		193	100%

1

Statistic	Value
Min Value	1
Max Value	4
Mean	2.97
Variance	1.11
Standard Deviation	1.06
Total Responses	193

3. Communicated water issues with elected officials

#	Answer		Response	%
1	I am still undecided		19	10%
2	NO, and I don't plan to		21	11%
3	NO, but I still plan to		45	23%
4	YES, I did		108	56%
	Total		193	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	3.25
Variance	1.00
Standard Deviation	1.00
Total Responses	193

4. Helped develop a plan for your watershed (Watershed Protection Plan)

#	Answer		Response	%
1	I am still undecided		23	12%
2	NO, and I don't plan to		42	22%
3	NO, but I still plan to		74	38%
4	YES, I did		54	28%
	Total		193	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	2.82
Variance	0.95
Standard Deviation	0.97
Total Responses	193

5. Please tell us if you adopted any of the following practices below based on what you learned at the Texas Watershed Steward Workshop.

Helped form or become a member of a local watershed group.

#	Answer		Response	%
1	I am still undecided		27	14%
2	NO, and I don't plan to		35	19%
3	NO, but I still plan to		57	30%
4	YES, I did		70	37%
	Total		189	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	2.90
Variance	1.12
Standard Deviation	1.06
Total Responses	189

6. Gotten involved in a volunteer water quality monitoring program

#	Answer		Response	%
1	I am still undecided		34	18%
2	NO, and I don't plan to		49	26%
3	NO, but I still plan to		51	27%
4	YES, I did		55	29%
	Total		189	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	2.67
Variance	1.17
Standard Deviation	1.08
Total Responses	189

7. Given a presentation to a school class or other community group on watershed stewardship/water quality issues

#	Answer		Response	%
1	I am still undecided		24	13%
2	NO, and I don't plan to		49	26%
3	NO, but I still plan to		40	21%
4	YES, I did		76	40%
	Total		189	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	2.89
Variance	1.16
Standard Deviation	1.08
Total Responses	189

8. Encouraged others in your community to attend a TWS workshop

#	Answer		Response	%
1	I am still undecided		15	8%
2	NO, and I don't plan to		7	4%
3	NO, but I still plan to		35	19%
4	YES, I did		132	70%
	Total		189	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	3.50
Variance	0.80
Standard Deviation	0.90
Total Responses	189

9. Please tell us if you adopted any of the following practices below based on what you learned at the Texas Watershed Steward Workshop.

More closely monitored individual actions that can impair water quality

#	Answer		Response	%
1	I am still undecided		3	2%
2	NO, and I don't plan to		7	4%
3	NO, but I still plan to		9	5%
4	YES, I did		167	90%
	Total		186	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	3.83
Variance	0.32
Standard Deviation	0.56
Total Responses	186

10. Adopted/maintained Best Management Practices (BMPs) on your property or in your community related to improving water quality

#	Answer		Response	%
1	I am still undecided		4	2%
2	NO, and I don't plan to		7	4%
3	NO, but I still plan to		18	10%
4	YES, I did		157	84%
	Total		186	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	3.76
Variance	0.39
Standard Deviation	0.62
Total Responses	186

11. Adopted soil testing practices

#	Answer		Response	%
1	I am still undecided		19	10%
2	NO, and I don't plan to		37	20%
3	NO, but I still plan to		69	37%
4	YES, I did		61	33%
	Total		186	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	2.92
Variance	0.93
Standard Deviation	0.97
Total Responses	186

12. Have you used the resourced/materials provided to you at the workshop?

#	Answer		Response	%
1	Yes		149	81%
2	No		36	19%
	Total		185	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.19
Variance	0.16
Standard Deviation	0.40
Total Responses	185

13. Have you shared the resources/materials provided to you at the workshop with others?

#	Answer		Response	%
1	Yes		120	65%
2	No		65	35%
	Total		185	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.35
Variance	0.23
Standard Deviation	0.48
Total Responses	185

14. Were you satisfied with the resources/materials provided to you at the workshop?

#	Answer		Response	%
1	Yes		176	95%
2	No		9	5%
	Total		185	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.05
Variance	0.05
Standard Deviation	0.22
Total Responses	185

15. Have you used the TWS on-line modules available at http://tws.tamu.edu/?

#	Answer		Response	%
1	Yes		25	14%
2	No		160	86%
	Total		185	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.86
Variance	0.12
Standard Deviation	0.34
Total Responses	185